RF Products

Freescale Semiconductor
Selector Guide

SG46
Rev. 37
10/2011

RF Product Selector Guide

Freescale is the global leader in RF transistors for power amplifiers, the most trusted source of RF solutions for more than 30 years. Freescale offers RF solutions for most communication and industrial applications serving wireless infrastructure, broadcast, aerospace, land mobile communication and industrial, scientific and medical (ISM) markets.

With products ranging from less than 100 mW to 1.25 kW using GaAs and LDMOS technologies, Freescale offers the broadest portfolio of RF power transistors. High-performing and innovative, Freescale solutions are available to meet any of today's RF application challenges, including reduction in overall system cost, form factor size reduction and simplified system design. Freescale maintains the highest standards for quality and long term reliability and, as the largest manufacturer of devices, is a proven partner for supply chain security.

Backed by a global team dedicated to RF power products, reference design hardware and product models, Freescale also provides the tools and support required to enable successful designs.

How to Use This Selector Guide

RF Low Power Amplifiers, RF Power Transistors and RF Power Amplifier ICs are FIRST divided into major categories by frequency band. SECOND, within each category, parts are listed by power level. THIRD, within a frequency band, transistors and ICs are further grouped by generation of LDMOS where applicable.

Applications Assistance

Applications assistance is only a phone call away – call the nearest Freescale Semiconductor Sales office or 1-800-521-6274.

Access Data On-Line

Use the Internet to access semiconductor product data at http://www.freescale.com or http://www.freescale.com/rf. This web site provides you with instant access to parametric search, part number search, product summary pages, data sheets, selector guide information, application information, design tools, package outlines, on-line technical support and much more.

Table of Contents

Access Data On-Line

Available online are part number search, the product library, documentation library, software and tools library, application sites, product sites, sales and support, training and where to buy at the following URL:
http://www.freescale.com.

See the RF Design Resources at
http://www.freescale.com/RFpower
http://www.freescale.com/RFlowpower and
http://www.freescale.com/RFMMIC for specific RF product support information for:

- Data sheets
- Applications notes
- Selector guides
- Packaging information
- Application information
- Models
- MTTF Calculators
- .s2p Files
- Events
- RF Power Selector

Design Tools and Data Available On-Line for Your Design-in Process

RF High Power Models

Freescale Semiconductor continues to populate its RF High Power Model Library with FET^2, MET and Root models. All product models available in the RF High Power Model Library (FET^2, MET and Root) include package, bond wire and internal matching network effects.

The FET^2 and MET models for RF High Power transistors and RF ICs are nonlinear models that examine both electrical and thermal phenomena and can account for dynamic self-heating effects of device performance. They are specifically tailored to model high power RF transistors and RF ICs used in wireless base station applications.

Implemented in the Agilent® EEsof® EDA Advanced Design System and AWR Microwave Office®, the FET^2 and MET models are capable of performing small-signal, large-signal, harmonic-balance, noise and transient simulations. Because of their ability to simulate self-heating effects, the FET^2 and MET models are more accurate than existing models, enabling circuit designers to predict prototype performance more accurately and reduce design cycle time.

The current release of the FET^2 and MET models are available for these tools:

- Agilent EEsof ADS nonlinear circuit simulator
- AWR Microwave Office

The RF High Power Model Library is available for all major computer platforms supported by these simulators.

For more information and latest releases supported, go to http://www.freescale.com/rf/models.

RF Power Electromigration MTTF Calculation Program

Program Functionality

This MTTF/FIT calculator software is designed to assist our customers in estimating the LDMOS device reliability in terms of electromigration wear-out failures. The program evaluates LDMOS device Median-Time-To-Failure (MTTF) using Black's Equations. It also estimates the Failures-in-Time (FIT) value at the expected base station transceiver system (BTS) life span.

About the Program

This program is designed for estimating LDMOS device electromigration failure rate. According to electromigration theory, there are two wear-out modes for silicon components employing aluminum as a metallization material:

- The formation of an electrically open circuit due to the condensation of vacancies in the aluminum to form voids.
- The growth of etch-pits into silicon by the dissolution of silicon into aluminum (to short out an underlying junction).

The program also estimates the FIT value at the expected base BTS life span. The calculation requires input for the drain voltage, drain currents, case temperature, RF input/output power and expected BTS life.

MTTF Calculator Availability

RF Power MTTF calculators are being added to the Freescale Semiconductor web site for all RF Power LDMOS discrete transistor and IC devices. Go to http://www.freescale.com/rf and select Software & Tools/Development Tools/Calculators.

Literature Centers

Printed literature can be obtained from the Literature Centers at a cost. The U.S. Literature Center has multiple credit card options as an available form of payment.

Home Page:
www.freescale.com

Web Support:
http://www.freescale.com/support

USA/Europe or Locations Not Listed:
Freescale Semiconductor, Inc.
Technical Information Center, EL516
2100 East Elliot Road
Tempe, Arizona 85284
1-800-521-6274 or +1-480-768-2130
www.freescale.com/support

Europe, Middle East, and Africa:
Freescale Halbleiter Deutschland GmbH
Technical Information Center
Schatzbogen 7
81829 Muenchen, Germany
+44 1296 380 456 (English)
+46 8 52200080 (English)
+49 89 92103 559 (German)
+33 1 69 35 48 48 (French)
www.freescale.com/support

Japan:
Freescale Semiconductor Japan Ltd.
Headquarters
ARCO Tower 15F
1-8-1, Shimo-Meguro, Meguro-ku,
Tokyo 153-0064
Japan
0120 191014 or +81 3 5437 9125
support.japan@freescale.com

Asia/Pacific:
Freescale Semiconductor China Ltd.
Exchange Building 23F
No. 118 Jianguo Road
Chaoyang District
Beijing 100022
China
+86 10 5879 8000
support.asia@freescale.com

For Literature Requests Only:
Freescale Semiconductor Literature Distribution Center
1-800-441-2447 or +1-303-675-2140
Fax: +1-303-675-2150
LDCForFreescaleSemiconductor@hibbertgroup.com

RF Low Power

Table of Contents

RF General Purpose Amplifiers

Freescale's portfolio of GPAs combine the right level of gain, linearity, noise and power consumption specifications to meet the industry's most demanding applications. From high gain, small-signal applications found in consumer and commercial to industrial applications, Freescale GPAs provide an excellent solution.

Table 1. General Purpose Amplifiers — InGaP HBT, GaAs HFET, GaAs E-pHEMT

Product	Frequency Band MHz	Supply Voltage (Typ) Volts	Supply Current (Typ) mA	Small Signal Gain (Typ)/Freq. dB/MHz	P1dB (Typ)/Freq. dBm/MHz	3rd Order Output Intercept (Typ)/Freq. dBm/MHz	NF (Typ)/Freq. dB/MHz	θ_{JC} °C/W	Packaging
MMG3008NT1[18f]	0-6000	5	38	18.5/900	15/900	26/900	4/900	84	SOT-89
MMG3011NT1[18f]	0-6000	5	41	15/900	15/900	28/900	4.6/900	83	SOT-89
MMG3007NT1[18f]	0-6000	5	47	19/900	16/900	30/900	3.8/900	77	SOT-89
MMG3009NT1[18f]	0-6000	5	70	15/900	18/900	34/900	4.2/900	81	SOT-89
MMG3012NT1[18f]	0-6000	5	70	19/900	18.5/900	34/900	3.8/900	85	SOT-89
MMG3015NT1[18f]	0-6000	5	95	15.5/900	20.5/900	36/900	5.6/900	41.5	SOT-89
MMG3H21NT1[18f]	0-6000	5	90	19.3/900	20.5/900	37/900	5.5/900	38.6	SOT-89
MMH3111NT1[18f]	250-4000	5	150	12/900	22.5/900	44/900	3.2/900	37.5	SOT-89
MMG15241HT1[18f]	500-2800	5	85	15.9/2140	24/2140	39.4/2140	1.6/2140	59	SOT-89
MMG3014NT1[18f]	40-4000	5	135	19.5/900	25/900	40.5/900	5.7/900	27.4	SOT-89
MMG3004NT1[18f]	400-2200	5	250	16/2140	27/2140	44/2140	3.4/2140	23.2	PQFN 5x5
MMG20271HT1[18f]	1500-2700	5	180	16/2140	27.5/2140	42/2140	1.7/2140	38	QFN 3x3
MMG20271H9[46c]	1500-2700	5	215	15.5/2140	27.5/2140	42/2140	1.8/2140	29	SOT-89
MMG3005NT1[18f]	800-2200	5	480	15/2140	30/2140	47/2140	5/2140	21.5	PQFN 5x5
MMG3006NT1[18f]	400-2400	5	850	17.5/900	33/900	49/900	6.6/900	7.8	QFN 4x4

Table 2. General Purpose Amplifiers — SiGe

Product	RF Freq. Range MHz	Supply Volt. Range Vdc	Supply Current mA (Typ)	Standby Current μA (Typ)	Small Signal Gain (Typ)/Freq. dB/MHz	NF (Typ)/Freq. dB/MHz	Output IP3 dBm (Typ)/Freq. dBm/MHz	Packaging	System Applicability
MBC13916NT1[18c]	100 to 2500	2.1 to 3.0	4.7	—	19/900 11.5/1900	1.25/900 2.1/1900	13.5/900 5.5/1900	1404/ SOT-343R	General Purpose for Smart Metering, RKE, VCOs
MBC13917EP[18c]	100 to 2500	2.1 to 3.0	4.7	—	27/434 24/900	2.3/434 1.2/900	10.9/434 12.4/900	2129/ MLP6	General Purpose for Smart Metering, RKE, VCOs
MBC13720NT1[18c]	400 to 2500	2.3 to 3.0	5 Low IP3 11 High IP3	<2	20/900 14/1900	1.2/900 1.38/1900	22/900 24/1900	419B/ SOT-363	Smart Metering, RKE, TPMS, Cellular, UHF, ISM, CDMA, PCS, WLAN
MC13850EP[18c]	400 to 2500	2.3 to 3.0	5 Low IP3 11 High IP3	<2	24.1/470 15/1900	1.38/1900 1.55/2400	16.3/470 24.6/1900	2128/ MLP8	Smart Metering, RKE, TPMS, Cellular, UHF, ISM, CDMA, PCS, WLAN

[18]Tape and Reel Packaging Options: a) R1 = 500 units; b) R2 = 2,500 units; c) T1 = 3,000 units; d) T3 = 10,000 units; e) R2 = 1,500 units; f) T1 = 1,000 units; g) R2 = 4,000 units; h) R1 = 1,000 units; i) R3 = 250 units; j) T1 = 500 units; k) R2 = 450 units; l) T1 = 5,000 units; m) R2 = 2,000 units; n) R4 = 100 units; o) R6 = 150 units; p) R5 = 50 units.

[46]To be introduced: a) 2Q11; b) 3Q11; c) 4Q11; d) 1Q12.

RF Linear Amplifiers

Table 1. Linear Amplifiers — InGaP HBT

Product	Frequency Band MHz	Supply Voltage (Typ) Volts	Supply Current (Typ) mA	Small Signal Gain (Typ)/Freq. dB/MHz	P1dB (Typ)/Freq. dBm/MHz	3rd Order Output Intercept (Typ)/Freq. dBm/MHz	NF (Typ)/Freq. dB/MHz	θ_{JC} °C/W	Packaging
MMZ09312B[46c]	400–1000	3–5	74	31.5/900	29.6/900	42/900	4/900	56	QFN 3x3
MMA25312B[9]	2300–2700	3–5	70	26/2500	30/2500	43/2500	5.8/2500	—	QFN 3x3
MMA20312BVT1[18f]★	1800–2200	3–5	70	27.2/2140	30.5/2140	44.5/2140	3.3/2140	52	QFN 3x3
MMA20312BT1[18f]	1800–2200	5	70	27.2/2140	30.5/2140	44.5/2140	3.3/2140	52	QFN 3x3
MMZ25332B[9]	2300–2700	3–5	400	25/2500	33/2500	46/2500	5.8/2500	—	QFN 3x3

[9]Product under development.

[18]Tape and Reel Packaging Options: a) R1 = 500 units; b) R2 = 2,500 units; c) T1 = 3,000 units; d) T3 = 10,000 units; e) R2 = 1,500 units; f) T1 = 1,000 units; g) R2 = 4,000 units; h) R1 = 1,000 units; i) R3 = 250 units; j) T1 = 500 units; k) R2 = 450 units; l) T1 = 5,000 units; m) R2 = 2,000 units; n) R4 = 100 units; o) R6 = 150 units; p) R5 = 50 units.

[46]To be introduced: a) 2Q11; b) 3Q11; c) 4Q11; d) 1Q12.

★New Product

RF Low Noise Amplifiers

Table 1. Low Noise Amplifiers – GaAs E-pHEMT

Product	Frequency Band MHz	Supply Voltage (Typ) Volts	Supply Current (Typ) mA	Small Signal Gain (Typ)/Freq. dB/MHz	P1dB (Typ)/Freq. dBm/MHz	3rd Order Output Intercept (Typ)/Freq. dBm/MHz	NF (Typ)/Freq. dB/MHz	θ_{JC} °C/W	Pkg/Style
MMG20211HT1[18f]★	1400–2800	5	60	18.6/2140	21.3/2140	33/2140	0.65/2140	43.4	DFN 2x2
MML09211HT1[18f]★	400–1400	5	60	21.3/900	22/900	32.6/900	0.52/900	37.5	DFN 2x2
MML09212H[46d]	400–1400	5	155	38.5/900	22.5/900	37/900	0.55/900	37.3	QFN 3x3
MMG15241HT1[18f]	500–2800	5	85	15.9/2140	24/2140	39.4/2140	1.6/2140	59	SOT–89
MML20242H[46d]	1400–2800	5	155	33/2140	24/2140	39.5/2140	0.75/2140	40	QFN 3x3
MMG20271HT1[18f]	1500–2700	5	180	16/2140	27.5/2140	42/2140	1.7/2140	38	QFN 3x3
MMG20271H9[46c]	1500–2700	5	215	15.5/2140	27.5/2140	42/2140	1.8/2140	29	SOT–89

Table 2. Low Noise Amplifiers – SiGe BiCMOS

Product	RF Freq. Range MHz	Supply Volt. Range Vdc	Supply Current mA (Typ)	Standby Current μA (Typ)	Small Signal Gain (Typ)/Freq. dB/MHz	Output IP3 (Typ)/Freq. dBm/MHz	NF (Typ)/Freq. dB/MHz	Packaging	System Applicability
MBC13916NT1[18c]	100 to 2500	2.1 to 3.0	4.7	—	19/900 11.5/1900	13.5/900 5.5/1900	1.25/900 2.1/1900	1404/ SOT–343R	General Purpose for Smart Metering, RKE, VCOs
MBC13917EP[18c]	100 to 2500	2.1 to 3.0	4.7	—	27/434 24/900	10.9/434 12.4/900	2.3/434 1.2/900	2129/ MLP6	General Purpose for Smart Metering, RKE, VCOs
MBC13720NT1[18c]	400 to 2500	2.3 to 3.0	5 Low IP3 11 High IP3	<2	20/900 14/1900	22/900 24/1900	1.2/900 1.38/1900	419B/ SOT–363	Smart Metering, RKE, TPMS, UHF, ISM, CDMA, PCS
MC13850EP[18c]	400 to 2500	2.3 to 3.0	5 Low IP3 11 High IP3	<2	24.1/470 15/1900	16.3/470 24.6/1900	1.38/1900 1.55/2400	2128/ MLP8	Smart Metering, RKE, TPMS, Cellular, UHF, ISM, CDMA, PCS
MC13851EP[18c]	1000 to 2500	2.3 to 3.0	3.8	<4	18.9/1575 18/1960	15.9/1575 17.1/1960	1.27/1575 1.35/1960	2128/ MLP8	W–CDMA, PCS, GPS, Cellular, 2400 ISM
MC13852EP[18c]	400 to 1000	2.3 to 3.0	4.4	<4	19.3/434 18.2/900	7.9/434 13.1/900	1.6/434 1.2/900	2128/ MLP8	Smart Metering, RKE, Cellular, UHF, ISM, CDMA, PCS
MC13853FCR2[18b]	800–2400	2.6 to 3.0	6 7.8 8.6	<10	13.5/880 13.5/1960 15/2140	11/880 11/1960 12.5/2140	1.4/880 1.55/1960 1.55/2140	1919/ QFN–16	Cellular W–CDMA
MC13821FCR2[18b]	1000–2500	2.7 to 3.0	2.8	<10	16.4/1900 14.7/2140	17.4/1900 19.2/2140	1.25/1900 1.3/2140	1345/ QFN–12	WCDMA, PCS, GPS

[18]Tape and Reel Packaging Options: a) R1 = 500 units; b) R2 = 2,500 units; c) T1 = 3,000 units; d) T3 = 10,000 units; e) R2 = 1,500 units; f) T1 = 1,000 units; g) R2 = 4,000 units; h) R1 = 1,000 units; i) R3 = 250 units; j) T1 = 500 units; k) R2 = 450 units; l) T1 = 5,000 units; m) R2 = 2,000 units; n) R4 = 100 units; o) R6 = 150 units; p) R5 = 50 units.

[46]To be introduced: a) 2Q11; b) 3Q11; c) 4Q11; d) 1Q12.

★New Product

RF Low Power Packages

CASE 419B
PLASTIC
(SOT-363)

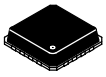
CASE 1345
PLASTIC
(QFN-12)

CASE 1404
PLASTIC
(SOT-343R)

SCALE 2:1

CASE 1514
STYLE 1, 2
PLASTIC
(SOT-89)

CASE 1543
PLASTIC
(PQFN 5x5)



SCALE 2:1

CASE 1898
PLASTIC
(QFN 4x4)

SCALE 2:1

CASE 1919
PLASTIC
(QFN-16)

SCALE 2:1

CASE 2128
PLASTIC
(MLP-8)

SCALE 2:1

CASE 2129
PLASTIC
(MLP-6)

SCALE 3:1

CASE 2131
PLASTIC
(QFN 3x3)

SCALE 3:1

CASE 2132
PLASTIC
(DFN 2x2)

SCALE 2:1

CASE 2142
PLASTIC
(SOT-89)

SCALE 1:1

RF Transistors

Freescale Semiconductor continues to be the industry leader in RF transistor technology. With recent extensions of the RF transistor portfolio, Freescale now provides power amplifier products for cellular infrastructure, mobile radio, commercial aerospace, industrial, scientific and medical (ISM), VHF/UHF broadcast, and general purpose applications. Technical innovation combined with world-class manufacturing capability allows Freescale to offer world-class product, service and support to its customers.

From our LDMOS and GaAs portfolio, the user can choose from a variety of packages. They include over-molded plastic and air cavity that are microstrip circuit compatible or surface mountable. Many are designed for automated assembly equipment.

Table of Contents

RF Power LDMOS Transistors

Freescale Semiconductor LDMOS technology is ideally suited for RF power amplifier applications. Several families of products have been targeted for specific markets including VHF and UHF mobile radio, digital television broadcast, GSM, GSM/EDGE, CDMA, W-CDMA and LTE. The high gain and excellent linear performance of these devices is suitable for any application, including advanced digital modulations and pulsed applications with high signal peak-to-average ratios.

Table 1. Cellular - To 1000 MHz - Class AB

Product	Frequency Band[37] MHz		P_{out} (Typ) Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
MW6S004NT1[18f]	U	1-2000	4 PEP	2-Tone	28	18/1960	33	8.8	466/1 (PLD 1.5)
MW6S010NR1[18a]	U	450-1500	10 PEP	2-Tone	28	18/960	32	2.85	1265/1 (TO-270-2)
MW6S010GNR1[18a]	U	450-1500	10 PEP	2-Tone	28	18/960	32	2.85	1265A/1 TO-270-2 Gull)
MRF8S7120NR3[18i]	I/O	728-768	32 AVG	W-CDMA	28	19.2/768	38.1	0.65	2021/1 (OM-780-2)
MRF8S7170NR3[18i]	I/O	728-768	50 AVG	W-CDMA	28	19.5/748	37	0.37	2021/1 (OM-780-2)
MRFE6S8046NR1[18a]	I/O	864-894	35.5 CW	1-Tone	28	19.8/894	57.7	1.7	1486/1 (TO-270 WB-4)
MRFE6S8046GNR1[18a]	I/O	864-894	35.5 CW	1-Tone	28	19.8/894	57.7	1.7	1487/1 (TO-270 WB-4 Gull)
MRF8S8260HR3[18i]	I/O	850-895	70 AVG	W-CDMA	28	21.1/895	37.5	0.36	465B/1 (NI-880)
MRF8S8260HSR3[18i]	I/O	850-895	70 AVG	W-CDMA	28	21.1/895	37.5	0.36	465C/1 (NI-880S)
MRF8P8300HR6[18o]	I/O	790-820	96 AVG	W-CDMA	28	20.9/820	35.7	0.26	375D/1 (NI-1230)
MRF8P8300HSR6[18o]	I/O	790-820	96 AVG	W-CDMA	28	20.9/820	35.7	0.26	375E/1 (NI-1230S)
MRF8P9040NR1[18a]	I	728-960	4 AVG	W-CDMA	28	19.9/960	19.1	1.5	1486/1 (TO-270 WB-4)
MRF8P9040GNR1[18a]	I	728-960	4 AVG	W-CDMA	28	19.9/960	19.1	1.5	1487/1 (TO-270 WB-4 Gull)
MRF8P9040NBR1[18a]	I	728-960	4 AVG	W-CDMA	28	19.9/960	19.1	1.5	1484/1 (TO-272 WB-4)
MRFE6S9045NR1[18a]	U	865-895	10 AVG	N-CDMA	28	22.1/880	32	1.1	1265/1 (TO-270-2)
MRFE6S9046NR1[18a]	I/O	920-960	35.5 CW	1-Tone	28	19/960	57	1.3	1486/1 (TO-270 WB-4)
MRFE6S9046GNR1[18a]	I/O	920-960	35.5 CW	1-Tone	28	19/960	57	1.3	1487/1 (TO-270 WB-4 Gull)
MRFE6S9060NR1[18a]	U	865-895	14 AVG	N-CDMA	28	21.4/880	32.1	0.88	1265/1 (TO-270-2)
MD8IC970NR1[18a]	I/O	850-940	35 AVG	2-Tone	28	32.6/940	42.1	0.6	1866/- (TO-270 WBL-16)
MD8IC970GNR1[18a]★	I/O	850-940	35 AVG	2-Tone	28	32.6/940	42.1	0.6	1867/- (TO-270 WBL-16 Gull)
MRF5S9080NBR1[18a]	I	869-960	80 CW	1-Tone	26	18.5/960	60	0.5	1484/1 (TO-272 WB-4)
MRF8S9100HR3[18i]	I	920-960	72 CW	1-Tone	28	19.3/920	51.6	0.65	465/1 (NI-780)
MRF8S9100HSR3[18i]	I	920-960	72 CW	1-Tone	28	19.3/920	51.6	0.65	465A/1 (NI-780S)
MRF8S9102NR3[18i]	I/O	865-960	28 AVG	W-CDMA	28	23.1/920	36.4	0.63	2021/1 (OM-780-2)
MRF8S9120NR3[18i]	I/O	865-960	33 AVG	W-CDMA	28	19.8/960	34.2	0.62	2021/1 (OM-780-2)
MRFE6S9125NR1[18a]	I	865-895	27 AVG	N-CDMA	28	20.2/880	31	0.45	1486/1 (TO-270 WB-4)
MRFE6S9125NBR1[18a]	I	865-895	27 AVG	N-CDMA	28	20.2/880	31	0.45	1484/1 (TO-272 WB-4)
MRFE6S9135HSR3[18i]	I/O	920-960	39 AVG	W-CDMA	28	21/940	32.3	0.48	465C/1 (NI-880S)
MRFE6S9160HSR3[18i]	I	865-960	35 AVG	N-CDMA	28	21/880	31	0.33	465A/1 (NI-780S)
MRF8S9170NR3[18i]	I/O	920-960	50 AVG	W-CDMA	28	19.3/920	36.5	0.38	2021/1 (OM-780-2)
MRF8S9200NR3[18i]	I/O	920-960	58 AVG	W-CDMA	28	19.9/940	37.1	0.30	2021/1 (OM-780-2)
MRFE6S9201HR3[18i]	I	865-895	40 AVG	N-CDMA	28	20.8/880	31.3	0.30	465/1 (NI-780)
MRFE6S9201HSR3[18i]	I	865-895	40 AVG	N-CDMA	28	20.8/880	31.3	0.30	465A/1 (NI-780S)
MRF8S9202NR3[18i]	I/O	920-960	58 AVG	W-CDMA	28	19.0/920	36.3	0.31	2021/1 (OM-780-2)
MRFE6S9205HSR3[18i]	I/O	865-895	58 AVG	W-CDMA	28	21.2/880	34	0.33	465C/1 (NI-880S)
MRFE6P9220HR3[18i]	I/O	865-900	47 AVG	N-CDMA	28	20/880	30	0.28	375G/1 (NI-860C3)
MRF8S9220HR3[18i]	I/O	920-960	65 AVG	W-CDMA	28	19.4/960	35.7	0.39	465/1 (NI-780)
MRF8S9220HSR3[18i]	I/O	920-960	65 AVG	W-CDMA	28	19.4/960	35.7	0.39	465A/1 (NI-780S)
MRF8S9232NR3[18i]★	I/O	865-960	63 AVG	W-CDMA	28	18.1/960	36.3	0.27	2021/1 (OM-780-2)
MRF8S9232GN[46c]	I/O	865-960	63 AVG	W-CDMA	28	18.1/960	36.3	0.27	—
MRF8S9260HR3[18i]	I/O	920-960	75 AVG	W-CDMA	28	18.6/960	38.5	0.37	465B/1 (NI-880)
MRF8S9260HSR3[18i]	I/O	920-960	75 AVG	W-CDMA	28	18.6/960	38.5	0.37	465C/1 (NI-880S)
MRF8P9300HR6[18o]	I/O	920-960	100 AVG	W-CDMA	28	19.4/960	35.8	0.22	375D/1 (NI-1230)
MRF8P9300HSR6[18o]	I/O	920-960	100 AVG	W-CDMA	28	19.4/960	35.8	0.22	375E/1 (NI-1230S)

[18]Tape and Reel Packaging Options: a) R1 = 500 units; b) R2 = 2,500 units; c) T1 = 3,000 units; d) T3 = 10,000 units; e) R2 = 1,500 units; f) T1 = 1,000 units; g) R2 = 4,000 units; h) R1 = 1,000 units; i) R3 = 250 units; j) T1 = 500 units; k) R2 = 450 units; l) T1 = 5,000 units; m) R2 = 2,000 units; n) R4 = 100 units; o) R6 = 150 units; p) R5 = 50 units.

[37]U = Unmatched; I = Input; I/O = Input/Output.

[46]To be introduced: a) 2Q11; b) 3Q11; c) 4Q11; d) 1Q12.

★New Product

Table 2. Cellular - To 2100 MHz - Class AB

Product	Frequency Band[37] MHz		P_{out} (Typ) Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
MW6S004NT1[18f]	U	1-2000	4 PEP	2-Tone	28	18/1960	33	8.8	466/1 (PLD 1.5)
MW6S010NR1[18a]	U	450-1500	10 PEP	2-Tone	28	18/960	32	2.85	1265/1 (TO-270-2)
MW6S010GNR1[18a]	U	450-1500	10 PEP	2-Tone	28	18/960	32	2.85	1265A/1 (TO-272-2)
MRF6S20010NR1[18a]	I	1600-2200	10 PEP	2-Tone	28	15.5/2170	36	5.9	1265/1 (TO-270-2)
MRF6S20010GNR1[18a]	I	1600-2200	10 PEP	2-Tone	28	15.5/2170	36	5.9	1265A/1 (TO-270-2 Gull)
MRF7S15100HR3[18i]	I/O	1470-1510	23 AVG	W-CDMA	28	19.5/1510	32	0.74	465/1 (NI-780)
MRF7S15100HSR3[18i]	I/O	1470-1510	23 AVG	W-CDMA	28	19.5/1510	32	0.74	465A/1 (NI-780S)
MRF7S16150HSR3[18i]	I/O	1600-1660	32 AVG	WiMAX	28	19.7/1660	25.4	0.37	465A/1 (NI-780S)
MRF6S18060NR1[18a]	I/O	1800-2000	60 CW	1-Tone	26	15/1990	50	0.81	1486/1 (TO-270 WB-4)
MRF8S18120HR3[18i]	I/O	1805-1880	72 CW	1-Tone	28	18.2/1805	49.8	0.47	465/1 (NI-780)
MRF8S18120HSR3[18i]	I/O	1805-1880	72 CW	1-Tone	28	18.2/1805	49.8	0.47	465A/1 (NI-780S)
MRF7S18170HSR3[18i]	I/O	1805-1880	50 AVG	W-CDMA	28	17.5/1805	31	0.30	465C/1 (NI-880S)
MRF8S18260HR6[18o]	I/O	1805-1880	74 AVG	W-CDMA	30	17.9/1805	31.6	0.27	375I/- (NI-1230-8)
MRF8S18260HSR6[18o]	I/O	1805-1880	74 AVG	W-CDMA	30	17.9/1805	31.6	0.27	375J/- (NI-1230S-8)
MRF8P18265HR6[18o]	I/O	1805-1880	72 AVG	W-CDMA	30	16/1840	43.7	0.27	375I/1 (NI-1230-8)
MRF8P18265HSR6[18o]	I/O	1805-1880	72 AVG	W-CDMA	30	16/1840	43.7	0.27	375J/1 (NI-1230S-8)
MRF7S19080HR3[18i]	I/O	1930-1990	24 AVG	W-CDMA	28	18/1990	32	0.69	465/1 (NI-780)
MRF7S19080HSR3[18i]	I/O	1930-1990	24 AVG	W-CDMA	28	18/1990	32	0.69	465A/1 (NI-780S)
MRF6S19100HR3[18i]	I/O	1930-1990	22 AVG	N-CDMA	28	16.1/1990	28	0.50	465/1 (NI-780)
MRF7S19100NR1[18a]	I/O	1930-1990	29 AVG	W-CDMA	28	17.5/1990	30	0.68	1486/1 (TO-270 WB-4)
MRF7S19100NBR1[18a]	I/O	1930-1990	29 AVG	W-CDMA	28	17.5/1990	30	0.68	1484/1 (TO-272 WB-4)
MRF7S19120NR1[18a]	I/O	1930-1990	36 AVG	W-CDMA	28	18/1990	32	0.51	1730 (TO-270 WBL-4)
MD7P19130HSR3[18i]	I/O	1930-1990	40 AVG	W-CDMA	28	20/1990	30	0.36	465H/1 (NI-780S-4)
MRF6S19140HSR3[18i]	I/O	1930-1990	29 AVG	N-CDMA	28	16/1990	27.5	0.38	465C/1 (NI-880S)
MRF8S19140HR3[18i]	I/O	1930-1990	34 AVG	W-CDMA	28	19.1/1960	31.4	0.48	465/1 (NI-780)
MRF8S19140HSR3[18i]	I/O	1930-1990	34 AVG	W-CDMA	28	19.1/1960	31.4	0.48	465A/1 (NI-780S)
MRF7S19170HSR3[18i]	I/O	1930-1990	50 AVG	W-CDMA	28	17.2/1990	32	0.31	465C/1 (NI-880S)
MRF6S19200HR3[18i]	I/O	1930-1990	56 AVG	W-CDMA	28	17.9/1990	29.5	0.36	465/1 (NI-780)
MRF7S19210HSR3[18i]	I/O	1930-1990	63 AVG	W-CDMA	28	20/1990	29	0.38	465A/1 (NI-780S)
MRF8S19260HR6[18o]	I/O	1930-1990	74 AVG	W-CDMA	30	18.2/1990	34.5	0.30	375I/- (NI-1230-8)
MRF8S19260HSR6[18o]	I/O	1930-1990	74 AVG	W-CDMA	30	18.2/1990	34.5	0.30	375J/- (NI-1230S-8)
MRF6S20010NR1[18a]	I	1930-1990	1 AVG	N-CDMA	28	15.5/1990	16	2.5	1265/1 (TO-270-2)
MRF6S20010GNR1[18a]	I	1930-1990	1 AVG	N-CDMA	28	15.5/1990	16	2.5	1265A/1 (TO-270-2 Gull)
MRF7P20040HR3[18i]	I/O	2010-2025	10 AVG	W-CDMA	32	18.2/2025	42.6	2.11	465M/1 (NI-780-4)
MRF7P20040HSR3[18i]	I/O	2010-2025	10 AVG	W-CDMA	32	18.2/2025	42.6	2.11	465H/1 (NI-780S-4)
MRF8P20100HR3[18i]	I/O	1805-2025	20 AVG	W-CDMA	28	16/2025	44.3	0.72	465M/1 (NI-780-4)
MRF8P20100HSR3[18i]	I/O	1805-2025	20 AVG	W-CDMA	28	16/2025	44.3	0.72	465H/1 (NI-780S-4)
MRF8P20140WHR3[18i]★	I/O	1880-2025	24 AVG	W-CDMA	28	15.9/2025	42.0	0.68	465M/1 (NI-780-4)
MRF8P20140WHSR3[18i]★	I/O	1880-2025	24 AVG	W-CDMA	28	15.9/2025	42.0	0.68	465H/1 (NI-780S-4)
MRF8P20160HR3[18i]	I/O	1880-2025	37 AVG	W-CDMA	28	16.5/1920	45.8	0.75	465M/1 (NI-780-4)
MRF8P20160HSR3[18i]	I/O	1880-2025	37 AVG	W-CDMA	28	16.5/1920	45.8	0.75	465H/1 (NI-780S-4)
MRF8P20161HSR3[18i]	I/O	1880-1920	37 AVG	W-CDMA	28	16.4/1920	45.8	0.76	465H/1 (NI-780S-4)
MRF8P20165WHR3[18i]★	I/O	1930-1995	37 AVG	W-CDMA	28	16.3/1995	46.0	0.79	465M/1 (NI-780-4)
MRF8P20165WHSR3[18i]★	I/O	1930-1995	37 AVG	W-CDMA	28	16.3/1995	46.0	0.79	465H/1 (NI-780S-4)

[18]Tape and Reel Packaging Options: a) R1 = 500 units; b) R2 = 2,500 units; c) T1 = 3,000 units; d) T3 = 10,000 units; e) R2 = 1,500 units; f) T1 = 1,000 units; g) R2 = 4,000 units; h) R1 = 1,000 units; i) R3 = 250 units; j) T1 = 500 units; k) R2 = 450 units; l) T1 = 5,000 units; m) R2 = 2,000 units; n) R4 = 100 units; o) R6 = 150 units; p) R5 = 50 units.

[37]U = Unmatched; I = Input; I/O = Input/Output.

★New Product

Table 3. Cellular – To 2200 MHz – Class AB

Product	Frequency Band[37]	MHz	P_{out} (Typ) Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
MRF6S20010NR1[18a]	I	2110–2170	1 AVG	W-CDMA	28	15.5/2170	15	2.5	1265/1 (TO-270-2)
MRF6S20010GNR1[18a]	I	2110–2170	1 AVG	W-CDMA	28	15.5/2170	15	2.5	1265A/1 (TO-270-2 Gull)
MRF5P21045NR1[18a]	I/O	2110–2170	10 AVG	W-CDMA	28	14.5/2110	25.5	1.48	1486/1 (TO-270 WB-4)
MRF6S21050LR3[18i]	I/O	2110–2170	11.5 AVG	W-CDMA	28	16/2170	27.7	1.28	465E/1 (NI-400)
MRF6S21050LSR3[18i]	I/O	2110–2170	11.5 AVG	W-CDMA	28	16/2170	27.7	1.28	465F/1 (NI-400S)
MRF7S21080HSR3[18i]	I/O	2110–2170	22 AVG	W-CDMA	28	18/2170	32	0.65	465A/1 (NI-780S)
MRF8HP21080HR3[18i]★	I/O	2110–2170	16 AVG	W-CDMA	28	14.4/2170	45.7	1.0	465M/1 (NI-780-4)
MRF8HP21080HSR3[18i]★	I/O	2110–2170	16 AVG	W-CDMA	28	14.4/2170	45.7	1.0	465H/1 (NI-780S-4)
MRF6S21100HR3[18i]	I/O	2110–2170	23 AVG	W-CDMA	28	15.9/2170	27.6	0.52	465/1 (NI-780)
MRF8S21100HR3[18i]	I/O	2110–2170	24 AVG	W-CDMA	28	18.3/2170	33.4	0.48	465/1 (NI-780)
MRF8S21100HSR3[18i]	I/O	2110–2170	24 AVG	W-CDMA	28	18.3/2170	33.4	0.48	465A/1 (NI-780S)
MRF7S21110HR3[18i]	I/O	2110–2170	33 AVG	W-CDMA	28	17.3/2170	32.5	0.41	465/1 (NI-780)
MRF7S21110HSR3[18i]	I/O	2110–2170	33 AVG	W-CDMA	28	17.3/2170	32.5	0.41	465A/1 (NI-780S)
MRF8S21120HR3[18i]	I/O	2110–2170	28 AVG	W-CDMA	28	17.6/2170	34	0.53	465/1 (NI-780)
MRF8S21120HSR3[18i]	I/O	2110–2170	28 AVG	W-CDMA	28	17.6/2170	34	0.53	465A/1 (NI-780S)
MRF8HP21130HR3[18i]★	I/O	2110–2170	28 AVG	W-CDMA	28	14.0/2170	45.1	0.60	465M/1 (NI-780-4)
MRF8HP21130HSR3[18i]★	I/O	2110–2170	28 AVG	W-CDMA	28	14.0/2170	45.1	0.60	465H/1 (NI-780S-4)
MRF6S21140HR3[18i]	I/O	2110–2170	30 AVG	W-CDMA	28	15.5/2110	27.5	0.38	465B/1 (NI-880)
MRF8S21140HR3[18i]	I/O	2110–2170	34 AVG	W-CDMA	28	17.9/2140	31.7	0.47	465/1 (NI-780)
MRF8S21140HSR3[18i]	I/O	2110–2170	34 AVG	W-CDMA	28	17.9/2140	31.7	0.47	465A/1 (NI-780S)
MRF7S21150HSR3[18i]	I/O	2110–2170	44 AVG	W-CDMA	28	17.5/2110	31	0.37	465A/1 (NI-780S)
MRF7S21170HR3[18i]	I/O	2110–2170	50 AVG	W-CDMA	28	16/2170	31	0.36	465B/1 (NI-880)
MRF7S21170HSR3[18i]	I/O	2110–2170	50 AVG	W-CDMA	28	16/2170	31	0.36	465C/1 (NI-880S)
MRF8S21172HR3[18i]★	I/O	2110–2170	42 AVG	W-CDMA	28	17.5/2170	31.6	0.41	465/1 (NI-780)
MRF8S21172HSR3[18i]★	I/O	2110–2170	42 AVG	W-CDMA	28	17.5/2170	31.6	0.41	465A/1 (NI-780S)
MRF6S21190HSR3[18i]	I/O	2110–2170	54 AVG	W-CDMA	28	16/2170	29	0.30	465C/1 (NI-880S)
MRF8S21200HR6[18o]	I/O	2110–2170	48 AVG	W-CDMA	28	18.1/2140	32.6	0.31	375D/1 (NI-1230)
MRF8S21200HSR6[18o]	I/O	2110–2170	48 AVG	W-CDMA	28	18.1/2140	32.6	0.31	375E/1 (NI-1230S)

Table 4. Cellular – To 3600 MHz – Class AB

Product	Frequency Band[37]	MHz	P_{out} (Typ) Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
MRF8P23080HR3[18i]	I/O	2300–2400	16 AVG	W-CDMA	28	14.6/2300	42	0.89	465M/1 (NI-780-4)
MRF8P23080HSR3[18i]	I/O	2300–2400	16 AVG	W-CDMA	28	14.6/2300	42	0.89	465H/1 (NI-780S-4)
MRF8S23120HR3[18i]	I/O	2300–2400	28 AVG	W-CDMA	28	16.0/2300	31.9	0.50	465/1 (NI-780)
MRF8S23120HSR3[18i]	I/O	2300–2400	28 AVG	W-CDMA	28	16.0/2300	31.9	0.50	465A/1 (NI-780S)
MRF8P23160WH[46c]	I/O	2300–2400	30 AVG	W-CDMA	28	13.8/2400	38.3	0.69	465M/1 (NI-780-4)
MRF8P23160WHS[46c]	I/O	2300–2400	30 AVG	W-CDMA	28	13.8/2400	38.3	0.69	465H/1 (NI-780S-4)
MRF8S26060HR3[18i]	I/O	2620–2690	15.5 AVG	W-CDMA	28	16.3/2690	32.9	1.0	465I/1 (NI-400-240)
MRF8S26060HSR3[18i]	I/O	2620–2690	15.5 AVG	W-CDMA	28	16.3/2690	32.9	1.0	465J/1 (NI-400S-240)
MRF8P26080HR3[18i]	I/O	2500–2700	14 AVG	W-CDMA	28	15.0/2620	36.9	0.88	465M/1 (NI-780-4)
MRF8P26080HSR3[18i]	I/O	2500–2700	14 AVG	W-CDMA	28	15.0/2620	36.9	0.88	465H/1 (NI-780S-4)

[18]Tape and Reel Packaging Options: a) R1 = 500 units; b) R2 = 2,500 units; c) T1 = 3,000 units; d) T3 = 10,000 units; e) R2 = 1,500 units; f) T1 = 1,000 units; g) R2 = 4,000 units; h) R1 = 1,000 units; i) R3 = 250 units; j) T1 = 500 units; k) R2 = 450 units; l) T1 = 5,000 units; m) R2 = 2,000 units; n) R4 = 100 units; o) R6 = 150 units; p) R5 = 50 units.

[37]U = Unmatched; I = Input; I/O = Input/Output.

[46]To be introduced: a) 2Q11; b) 3Q11; c) 4Q11; d) 1Q12.

★New Product

Table 4. Cellular – To 3600 MHz – Class AB (continued)

Product	Frequency Band[37] MHz		P_{out} (Typ) Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
MRF8S26120HR3[18i]	I/O	2620–2690	28 AVG	W–CDMA	28	15.6/2690	31.1	0.53	465/1 (NI–780)
MRF8S26120HSR3[18i]	I/O	2620–2690	28 AVG	W–CDMA	28	15.6/2690	31.1	0.53	465A/1 (NI–780S)
MRF6S27015NR1[18a]	I	2300–2700	3 AVG	W–CDMA	28	14/2600	22	2.2	1265/1 (TO–270–2)
MRF6S27015GNR1[18a]	I	2300–2700	3 AVG	W–CDMA	28	14/2600	22	2.2	1265A/1 (TO–270–2 Gull)
MRF6S27085HR3[18i]	I/O	2600–2700	20 AVG	N–CDMA	28	15.5/2700	23.5	0.56	465/1 (NI–780)
MRF6S27085HSR3[18i]	I/O	2600–2700	20 AVG	N–CDMA	28	15.5/2700	23.5	0.56	465A/1 (NI–780S)
MRF7S27130HR3[18i]	I/O	2500–2700	23 AVG	WiMAX	28	16.5/2700	20	0.36	465/1 (NI–780)
MRF7S27130HSR3[18i]	I/O	2500–2700	23 AVG	WiMAX	28	16.5/2700	20	0.36	465A/1 (NI–780S)
MRF6P27160HR6[18o]	I/O	2600–2700	35 AVG	N–CDMA	28	14.6/2700	22.6	0.31	375D/1 (NI–1230)
MRF7S38010HR3[18i]	I/O	3400–3600	2 AVG	WiMAX	30	15/3400, 3600	17	2.24	465I/1 (NI–400–240)
MRF7S38010HSR3[18i]	I/O	3400–3600	2 AVG	WiMAX	30	15/3400, 3600	17	2.24	465J/1 (NI–400S–240)
MRF7S38040HR3[18i]	I/O	3400–3600	8 AVG	WiMAX	30	14/3400, 3600	15.6	0.83	465I/1 (NI–400–240)
MRF7S38075HR3[18i]	I/O	3400–3600	12 AVG	WiMAX	30	14/3400, 3600	14	0.49	465/1 (NI–780)
MRF7S38075HSR3[18i]	I/O	3400–3600	12 AVG	WiMAX	30	14/3400, 3600	14	0.49	465A/1 (NI–780S)

Table 5. Professional Mobile Radio – To 1000 MHz – Class AB

Designed for broadband VHF and UHF commercial and industrial applications. The high gain and broadband performance of these devices make them ideal for large–signal, common–source amplifier applications in 12.5/7.5 volt mobile, portable and base station operation.

Product	Frequency Band[37] MHz		P_{out} Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
MRF1513NT1[18f]	U	400–520	3 CW	1–Tone	7.5/12.5	15/520	65	4.0	466/1 (PLD 1.5)
MRF1511NT1[18f]	U	135–175	8 CW	1–Tone	7.5	13/175	70	2.0	466/1 (PLD 1.5)
MRF1517NT1[18f]	U	430–520	8 CW	1–Tone	7.5	14/520	70	2.0	466/1 (PLD 1.5)
MRF1518NT1[18f]	U	400–520	8 CW	1–Tone	12.5	13/520	60	2.0	466/1 (PLD 1.5)
MRF1535NT1[18j]	U	400–520	35 CW	1–Tone	12.5	13.5/520	55	0.90	1264/1 (TO–272–6 Wrap)
MRF1535FNT1[18j]	U	400–520	35 CW	1–Tone	12.5	13.5/520	55	0.90	1264A/1 (TO–272–6)
MRF1550NT1[18j]	U	135–175	50 CW	1–Tone	12.5	14.5/175	55	0.50	1264/1 (TO–272–6 Wrap)
MRF1550FNT1[18j]	U	135–175	50 CW	1–Tone	12.5	14.5/175	55	0.50	1264A/1 (TO–272–6)
MRF1570NT1[18j]	U	400–470	70 CW	1–Tone	12.5	11.5/470	60	0.29	1366/1 (TO–272–8 Wrap)
MRF1570FNT1[18j]	U	400–470	70 CW	1–Tone	12.5	11.5/470	60	0.29	1366A/1 (TO–272–8)
MD8IC970NR1[18a]	I/O	850–940	35 AVG	2–Tone	28	32.6/940	42.1	0.6	1866/– (TO–270 WBL–16)
MD8IC970GNR1[18a]★	I/O	850–940	35 AVG	2–Tone	28	32.6/940	42.1	0.6	1867/– (TO–270 WBL–16 Gull)

[18]Tape and Reel Packaging Options: a) R1 = 500 units; b) R2 = 2,500 units; c) T1 = 3,000 units; d) T3 = 10,000 units; e) R2 = 1,500 units; f) T1 = 1,000 units; g) R2 = 4,000 units; h) R1 = 1,000 units; i) R3 = 250 units; j) T1 = 500 units; k) R2 = 450 units; l) T1 = 5,000 units; m) R2 = 2,000 units; n) R4 = 100 units; o) R6 = 150 units; p) R5 = 50 units.

[37]U = Unmatched; I = Input; I/O = Input/Output.

★New Product

Table 6. ISM – To 600 MHz – Class AB

Product	Frequency Band[37] MHz		P_{out} Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
MRF6VP11KHR6[18o]	U	10–150	1000 Peak	Pulsed	50	26/130	71	0.03	375D/1 (NI–1230)
MRF6VP21KHR6[18o]	U	10–235	1000 Peak	Pulsed	50	24/235	67.5	0.03	375D/1 (NI–1230)
MRF6VP41KHR6[18o]	U	10–450	1000 Peak	Pulsed	50	20/450	64	0.03	375D/1 (NI–1230)
MRF6VP41KHSR6[18o]	U	10–450	1000 Peak	Pulsed	50	20/450	64	0.03	375E/1 (NI–1230S)
MRF6V2010NR1[18a]	U	10–450	10 CW	1–Tone	50	23.9/220	62	3.0	1265/1 (TO–270–2)
MRF6V2010NBR1[18a]	U	10–450	10 CW	1–Tone	50	23.9/220	62	3.0	1337/1 (TO–272–2)
MRF6V2150NR1[18a]	U	10–450	150 CW	1–Tone	50	25/220	68.3	0.24	1486/1 (TO–270 WB–4)
MRF6V2150NBR1[18a]	U	10–450	150 CW	1–Tone	50	25/220	68.3	0.24	1484/1 (TO–272 WB–4)
MRF6V2300NR1[18a]	U	10–600	300 CW	1–Tone	50	25.5/220	68	0.24	1486/1 (TO–270 WB–4)
MRF6V2300NBR1[18a]	U	10–600	300 CW	1–Tone	50	25.5/220	68	0.24	1484/1 (TO–272 WB–4)
MRF6V4300NR1[18a]	U	10–600	300 CW	1–Tone	50	22/450	60	0.24	1486/1 (TO–270 WB–4)
MRF6V4300NBR1[18a]	U	10–600	300 CW	1–Tone	50	22/450	60	0.24	1484/1 (TO–272 WB–4)
MRF6VP2600HR6[18o]	U	2–500	125 AVG	OFDM	50	25/225	28.5	0.20	375D/1 (NI–1230)
MRFE6VP6300HR3[18i]	U	1.8–600	300 CW	1–Tone	50	25/300	80	0.19	465M/1 (NI–780–4)
MRFE6VP6300HSR3[18i]	U	1.8–600	300 CW	1–Tone	50	25/300	80	0.19	465H/1 (NI–780S–4)
MRFE6VP5600HR6[18o]	U	1.8–600	600 CW	1–Tone	50	24.6/230	75.2	0.12	375D/1 (NI–1230)
MRFE6VP5600HSR6[18o]	U	1.8–600	600 CW	1–Tone	50	24.6/230	75.2	0.12	375E/1 (NI–1230S)
MRFE6VP61K25HR6[18o]	U	1.8–600	1250 CW	1–Tone	50	22.9/1250	74.6	0.15	375D/1 (NI–1230)
MRFE6VP61K25HSR6[18o]	U	1.8–600	1250 CW	1–Tone	50	22.9/1250	74.6	0.15	375E/1 (NI–1230S)

Table 7. HF/VHF/UHF Broadcast – To 860 MHz – Class AB

Product	Frequency Band [37] MHz		P_{out} Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
MW6S004NT1[18f]	U	1–2000	4 PEP	2–Tone	28	18/1960	33	8.8	466/1 (PLD 1.5)
MW6S010NR1[18a]	U	450–1500	10 PEP	2–Tone	28	18/960	32	2.85	1265/1 (TO–270–2)
MW6S010GNR1[18a]	U	450–1500	10 PEP	2–Tone	28	18/960	32	2.85	1265A/1 (TO–270–2 Gull)
MRFE6S9045NR1[18a]	U	880	10 AVG	N–CDMA	28	22.1/880	32	1.1	1265/1 (TO–270–2)
MRFE6S9060NR1[18a]	U	880	14 AVG	N–CDMA	28	21.4/880	32.1	0.88	1265/1 (TO–270–2)
MRF6V3090NR1[18a]	I	470–860	18 AVG	OFDM	50	22/860	28.5	0.79	1486/1 (TO–270 WB–4)
MRF6V3090NR5[18p]	I	470–860	18 AVG	OFDM	50	22/860	28.5	0.79	1486/1 (TO–270 WB–4)
MRF6V3090NBR1[18a]	I	470–860	18 AVG	OFDM	50	22/860	28.5	0.79	1484/1 (TO–272 WB–4)
MRF6V3090NBR5[18p]	I	470–860	18 AVG	OFDM	50	22/860	28.5	0.79	1484/1 (TO–272 WB–4)
MRF6VP3091NR1[18a]★	I	470–860	18 AVG	OFDM	50	22/860	28.5	0.79	1486/1 (TO–270 WB–4)
MRF6VP3091NBR1[18a]★	I	470–860	18 AVG	OFDM	50	22/860	28.5	0.79	1484/1 (TO–272 WB–4)
MRFE6P3300HR3[18i]	I/O	470–860	270 PEP	2–Tone	32	20.4/860	44.8	0.23	375G/1 (NI–860C)
MRF6VP3450HR6[18o]	I	470–860	90 AVG	OFDM	50	22.5/860	28	0.27	375D/1 (NI–1230)
MRF6VP3450HR5[18p]	I	470–860	90 AVG	OFDM	50	22.5/860	28	0.27	375D/1 (NI–1230)
MRF6VP3450HSR6[18o]	I	470–860	90 AVG	OFDM	50	22.5/860	28	0.27	375E/1 (NI–1230S)
MRF6VP3450HSR5[18p]	I	470–860	90 AVG	OFDM	50	22.5/860	28	0.27	375E/1 (NI–1230S)
MRFE6VP8600HR6[18o]★	I	470–860	125 AVG	OFDM	50	19.3/860	30	0.19	375D/1 (NI–1230)
MRFE6VP8600HSR6[18o]★	I	470–860	125 AVG	OFDM	50	19.3/860	30	0.19	375E/1 (NI–1230S)

[18]Tape and Reel Packaging Options: a) R1 = 500 units; b) R2 = 2,500 units; c) T1 = 3,000 units; d) T3 = 10,000 units; e) R2 = 1,500 units; f) T1 = 1,000 units; g) R2 = 4,000 units; h) R1 = 1,000 units; i) R3 = 250 units; j) T1 = 500 units; k) R2 = 450 units; l) T1 = 5,000 units; m) R2 = 2,000 units; n) R4 = 100 units; o) R6 = 150 units; p) R5 = 50 units.

[37]U = Unmatched; I = Input; I/O = Input/Output.

★New Product

Table 8. Commercial Aerospace - L-Band - 960-1500 MHz - Class AB

Product	Frequency Band[37] MHz		P_{out} Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
MRF6V10010NR4[18n]	I/O	960-1400	10 Peak	Pulsed	50	25/1090	69	1.6	466/1 (PLD-1.5)
MRF6V13250HR3[18i]★	I/O	1300	250 Peak	Pulsed	50	22.7/1300	57.0	0.07	465/1 (NI-780)
MRF6V13250HSR3[18i]★	I/O	1300	250 Peak	Pulsed	50	22.7/1300	57.0	0.07	465A/1 (NI-780S)
MRF6V12250HR3[18i]	I/O	960-1215	275 Peak	Pulsed	50	20.3/1030	65.5	0.08	465/1 (NI-780)
MRF6V12250HSR3[18i]	I/O	960-1215	275 Peak	Pulsed	50	20.3/1030	65.5	0.08	465A/1 (NI-780S)
MRF6V14300HR3[18i]	I/O	1200-1400	330 Peak	Pulsed	50	18/1400	60.5	0.13	465/1 (NI-780)
MRF6V14300HSR3[18i]	I/O	1200-1400	330 Peak	Pulsed	50	18/1400	60.5	0.13	465A/1 (NI-780S)
MRF6V12500HR3[18i]	I/O	965-1215	500 Peak	Pulsed	50	19.7/1400	62	0.044	465/1 (NI-780)
MRF6V12500HSR3[18i]	I/O	965-1215	500 Peak	Pulsed	50	19.7/1400	62	0.044	465A/1 (NI-780S)
MRF6VP121KHR6[18o]	I/O	965-1215	1000 Peak	Pulsed	50	20/1030	56	0.02	375D/1 (NI-1230)
MRF6VP121KHSR6[18o]	I/O	965-1215	1000 Peak	Pulsed	50	20/1030	56	0.02	375E/1 (NI-1230S)

Table 9. Commercial Aerospace S-Band - 3100-3500 MHz - Class AB

Product	Frequency Band[37] MHz		P_{out} Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
MRF8P29300HR6[18o]	U	2700-2900	320 Peak	Pulsed	30	13.3/2900	50.5	0.06	375D/1 (NI-1230)
MRF8P29300HSR6[18o]	U	2700-2900	320 Peak	Pulsed	30	13.3/2900	50.5	0.06	375E/1 (NI-1230S)
MRF7S35015HSR3[18i]	I/O	3100-3500	15 Peak	Pulsed	32	16/3500	41	0.60	465J/1 (NI-400S-240)
MRF7S35120HSR3[18i]	I/O	3100-3500	120 Peak	Pulsed	32	12/3500	40	0.11	465A/1 (NI-780S)

Table 10. ISM Band - 2450 MHz - Class AB

Product	Frequency Band[37] MHz		P_{out} Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
MW7IC2425NR1[18a]	I/O	2450	25 CW	1-Tone	28	27.7/2450	43.8	1.2	1886/- (TO-270 WB-16)
MW7IC2425GNR1[18a]	I/O	2450	25 CW	1-Tone	28	27.7/2450	43.8	1.2	1887/- (TO-270 WB-16 Gull)
MW7IC2425NBR1[18a]	I/O	2450	25 CW	1-Tone	28	27.7/2450	43.8	1.2	1329/-(TO-272 WB-16)
MRF6S24140HR3[18i]	I/O	2450	140 CW	1-Tone	28	13.2/2450	45	0.29	465B/1 (NI-880)
MRF6S24140HSR3[18i]	I/O	2450	140 CW	1-Tone	28	13.2/2450	45	0.29	465C/1 (NI-880S)
MRF6P24190HR6[18o]	I/O	2450	190 CW	1-Tone	28	13.2/2450	46.2	0.22	375D/1 (NI-1230)

[18]Tape and Reel Packaging Options: a) R1 = 500 units; b) R2 = 2,500 units; c) T1 = 3,000 units; d) T3 = 10,000 units; e) R2 = 1,500 units; f) T1 = 1,000 units; g) R2 = 4,000 units; h) R1 = 1,000 units; i) R3 = 250 units; j) T1 = 500 units; k) R2 = 450 units; l) T1 = 5,000 units; m) R2 = 2,000 units; n) R4 = 100 units; o) R6 = 150 units; p) R5 = 50 units.

[37]U = Unmatched; I = Input; I/O = Input/Output.

[46]To be introduced: a) 2Q11; b) 3Q11; c) 4Q11; d) 1Q12.

★New Product

RF Power GaAs Transistors

Freescale Semiconductor GaAs power transistors are made using an InGaAs pHEMT or HFET epitaxial structure for superior RF efficiency and linearity. The FETs listed in this section are designed for operation in base station infrastructure RF power amplifiers and are grouped according to frequency range and type of application.

Table 1. Linear Transistors – To 6000 MHz – Class AB

Product	Frequency Band[37] MHz		P_{out} (Typ)/Freq Watts/MHz	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ)/Freq. %/MHz	θ_{JC} °C/W	Pkg/Style
MRFG35003ANT1[18f]	U	DC–6000	0.3 AVG/ 3550	W–CDMA[44]	12	10.8/3550	24.5/3550	15.9	466/1 (PLD 1.5)
MRFG35003N6AT1[18f]	U	DC–6000	0.45 AVG/ 3550	W–CDMA[44]	6	10/3550	27/3550	5.9	466/1 (PLD 1.5)
MRFG35005ANT1[18f]	U	DC–6000	0.45 AVG/ 3550	W–CDMA[44]	12	11/3550	26/3550	13.7	466/1 (PLD 1.5)
MRFG35010ANT1[18f]	U	DC–6000	1 AVG/ 3550	W–CDMA[44]	12	10/3550	25/3550	6.5	466/1 (PLD 1.5)
MRFG35010AR1[18a]	U	DC–6000	1 AVG/ 3550	W–CDMA[44]	12	10/3550	25/3550	4.0[16]	360D/1 (NI–360HF)

[16]Class A = 4.1

[18]Tape and Reel Packaging Options: a) R1 = 500 units; b) R2 = 2,500 units; c) T1 = 3,000 units; d) T3 = 10,000 units; e) R2 = 1,500 units; f) T1 = 1,000 units; g) R2 = 4,000 units; h) R1 = 1,000 units; i) R3 = 250 units; j) T1 = 500 units; k) R2 = 450 units; l) T1 = 5,000 units; m) R2 = 2,000 units; n) R4 = 100 units; o) R6 = 150 units; p) R5 = 50 units.

[37]U = Unmatched; I = Input; I/O = Input/Output.

[44]Peak–to–Average Power Ratio = 8.5 dB

RF Power LDMOS In-Package Doherty Transistors

Table 1. Cellular - To 1000 MHz

Product	Frequency Band[37]	MHz	P_{out} Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
MDE6IC7120NR1[18a]	I/O	728-768	25 AVG	W-CDMA	28	34.4/748	40.6	0.90	1866/- (TO-270 WBL-16)
MDE6IC7120GNR1[18a]	I/O	728-768	25 AVG	W-CDMA	28	34.4/748	40.6	0.90	1867 (TO-270 WBL-16 Gull)
MDE6IC9120NR1[18a]	I/O	920-960	25 AVG	W-CDMA	28	32/940	38	1.3	1866/- (TO-270 WBL-16)
MDE6IC9120GNR1[18a]	I/O	920-960	25 AVG	W-CDMA	28	32/940	38	1.3	1867/- (TO-270 WBL-16 Gull)

Table 2. Cellular - To 2100 MHz

Product	Frequency Band[37]	MHz	P_{out} Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
MD7IC2050NR1[18a]	I/O	1880-2025	10 AVG	W-CDMA	28	30.5/2025	34.7	1.9	1618/- (TO-270 WB-14)
MD7IC2050GNR1[18a]	I/O	1880-2025	10 AVG	W-CDMA	28	30.5/2025	34.7	1.9	1621/- (TO-270 WB-14 Gull)
MD7IC2050NBR1[18a]	I/O	1880-2025	10 AVG	W-CDMA	28	30.5/2025	34.7	1.9	1617/- (TO-272 WB-14)
MD7IC18120NR1[18a]	I/O	1805-1880	30 AVG	W-CDMA	28	25.8/1880	35.3	0.88	1866/- (TO-270 WBL-16)
MD7IC18120GNR1[18a]	I/O	1805-1880	30 AVG	W-CDMA	28	25.8/1880	35.3	0.88	1867/- (TO-270 WBL-16 Gull)
MRF8P18265HR6[18o]	I/O	1805-1880	72 AVG	W-CDMA	30	16/1840	43.7	0.27	375I/1 (NI-1230-8)
MRF8P18265HSR6[18o]	I/O	1805-1880	72 AVG	W-CDMA	30	16/1840	43.7	0.27	375J/1 (NI-1230S-8)
MRF7P20040HR3[18i]	I/O	2010-2025	10 AVG	W-CDMA	32	18.2/2025	42.6	2.11	465M/1 (NI-780-4)
MRF7P20040HSR3[18i]	I/O	2010-2025	10 AVG	W-CDMA	32	18.2/2025	42.6	2.11	465H/1 (NI-780S-4)
MRF8P20100HR3[18i]	I/O	1805-2025	20 AVG	W-CDMA	28	16/2025	44.3	0.88	465M/1 (NI-780-4)
MRF8P20100HSR3[18i]	I/O	1805-2025	20 AVG	W-CDMA	28	16/2025	44.3	0.88	465H/1 (NI-780S-4)
MRF8P20140WHR3[18i]★	I/O	1880-2025	24 AVG	W-CDMA	28	15.9/2025	42.0	0.68	465M/1 (NI-780-4)
MRF8P20140WHSR3[18i]★	I/O	1880-2025	24 AVG	W-CDMA	28	15.9/2025	42.0	0.68	465H/1 (NI-780S-4)
MRF8P20160HR3[18i]	I/O	1880-2025	37 AVG	W-CDMA	28	16.5/1920	45.8	0.75	465M/1 (NI-780-4)
MRF8P20160HSR3[18i]	I/O	1880-2025	37 AVG	W-CDMA	28	16.5/1920	45.8	0.75	465H/1 (NI-780S-4)
MRF8P20161HSR3[18i]	I/O	1880-1920	37 AVG	W-CDMA	28	16.4/1920	45.8	0.76	465H/1 (NI-780S-4)
MRF8P20165WHR3[18i]★	I/O	1930-1995	37 AVG	W-CDMA	28	16.3/1995	46.0	0.79	465M/1 (NI-780-4)
MRF8P20165WHSR3[18i]★	I/O	1930-1995	37 AVG	W-CDMA	28	16.3/1995	46.0	0.79	465H/1 (NI-780S-4)

Table 3. Cellular - To 2200 MHz

Product	Frequency Band[37]	MHz	P_{out} Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
MD7IC2250NR1[18a]	I/O	2110-2170	5.3 AVG	W-CDMA	28	31.1/2170	16.8	1.1	1618/- (TO-270 WB-14)
MD7IC2250GNR1[18a]	I/O	2110-2170	5.3 AVG	W-CDMA	28	31.1/2170	16.8	1.1	1621/- (TO-270 WB-14 Gull)
MD7IC2250NBR1[18a]	I/O	2110-2170	5.3 AVG	W-CDMA	28	31.1/2170	16.8	1.1	1617/- (TO-272 WB-14)
MRF8HP21080HR3[18i]★	I/O	2110-2170	16 AVG	W-CDMA	28	14.4/2170	45.7	1.0	465M/1 (NI-780-4)
MRF8HP21080HSR3[18i]★	I/O	2110-2170	16 AVG	W-CDMA	28	14.4/2170	45.7	1.0	465H/1 (NI-780S-4)
MD7IC21100NR1[18a]	I/O	2110-2170	32 AVG	W-CDMA	28	28.5/2170	30	0.7	1618/- (TO-270 WB-14)
MD7IC21100GNR1[18a]	I/O	2110-2170	32 AVG	W-CDMA	28	28.5/2170	30	0.7	1621/- (TO-270 WB-14 Gull)
MD7IC21100NBR1[18a]	I/O	2110-2170	32 AVG	W-CDMA	28	28.5/2170	30	0.7	1617/- (TO-272 WB-14)
MRF8HP21130HR3[18i]★	I/O	2110-2170	28 AVG	W-CDMA	28	14.0/2170	45.1	0.60	465M/1 (NI-780-4)
MRF8HP21130HSR3[18i]★	I/O	2110-2170	28 AVG	W-CDMA	28	14.0/2170	45.1	0.60	465H/1 (NI-780S-4)

[18]Tape and Reel Packaging Options: a) R1 = 500 units; b) R2 = 2,500 units; c) T1 = 3,000 units; d) T3 = 10,000 units; e) R2 = 1,500 units; f) T1 = 1,000 units; g) R2 = 4,000 units; h) R1 = 1,000 units; i) R3 = 250 units; j) T1 = 500 units; k) R2 = 450 units; l) T1 = 5,000 units; m) R2 = 2,000 units; n) R4 = 100 units; o) R6 = 150 units; p) R5 = 50 units.

[37]U = Unmatched; I = Input; I/O = Input/Output.

★New Product

Table 4. Cellular - To 2700 MHz

Product	Frequency Band[37] MHz		P_{out} Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
MRF8P23080HR3[18i]	I/O	2300-2400	16 AVG	W-CDMA	28	14.6/2300	42	0.89	465M/1 (NI-780-4)
MRF8P23080HSR3[18i]	I/O	2300-2400	16 AVG	W-CDMA	28	14.6/2300	42	0.89	465H/1 (NI-780S-4)
MRF8P26080HR3[18i]	I/O	2500-2700	14 AVG	W-CDMA	28	15.0/2620	36.9	0.88	465M/1 (NI-780-4)
MRF8P26080HSR3[18i]	I/O	2500-2700	14 AVG	W-CDMA	28	15.0/2620	36.9	0.88	465H/1 (NI-780S-4)
MD7IC2755NR1[18a]	I/O	2500-2700	10 AVG	WiMAX	28	25/2700	25	1.8	1618/- (TO-270 WB-14)
MD7IC2755GNR1[18a]	I/O	2500-2700	10 AVG	WiMAX	28	25/2700	25	1.8	1621/- (TO-270 WB-14 Gull)

[18]Tape and Reel Packaging Options: a) R1 = 500 units; b) R2 = 2,500 units; c) T1 = 3,000 units; d) T3 = 10,000 units; e) R2 = 1,500 units; f) T1 = 1,000 units; g) R2 = 4,000 units; h) R1 = 1,000 units; i) R3 = 250 units; j) T1 = 500 units; k) R2 = 450 units; l) T1 = 5,000 units; m) R2 = 2,000 units; n) R4 = 100 units; o) R6 = 150 units; p) R5 = 50 units.

[37]U = Unmatched; I = Input; I/O = Input/Output.

Wideband RF Power LDMOS Transistors

Table 1. Wideband RF Power LDMOS – Class AB

Product	Frequency Band[37] MHz		P_{out} (Typ) Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
To 520 MHz									
MRF1513NT1[18f]	U	400–520	3 CW	1–Tone	7.5/12.5	11/520	55	4.0	466/1 (PLD 1.5)
MRF1511NT1[18f]	U	135–175	8 CW	1–Tone	7.5	11.5/175	55	2.0	466/1 (PLD 1.5)
MRF1518NT1[18f]	U	400–520	8 CW	1–Tone	12.5	11/520	55	2.0	466/1 (PLD 1.5)
MRF1535NT1[18j]	U	400–520	35 CW	1–Tone	12.5	10/520	50	0.90	1264/1 (TO–272–6 Wrap)
MRF1535FNT1[18j]	U	400–520	35 CW	1–Tone	12.5	10/520	50	0.90	1264A/1 (TO–272–6)
MRF1550NT1[18j]	U	135–175	50 CW	1–Tone	12.5	10/175	50	0.50	1264/1 (TO–272–6 Wrap)
MRF1550FNT1[18j]	U	135–175	50 CW	1–Tone	12.5	10/175	50	0.50	1264A/1 (TO–272–6)
MRF1570NT1[18j]	U	400–470	70 CW	1–Tone	12.5	10/470	50	0.29	1366/1 (TO–272–8 Wrap)
MRF1570FNT1[18j]	U	400–470	70 CW	1–Tone	12.5	10/470	50	0.29	1366A/1 (TO–272–8)
To 1000 MHz									
MW6S004NT1[18f]	U	1–2000	4 PEP	2–Tone	28	18/1960	33	8.8	466/1 (PLD 1.5)
MW7IC008NT1[18f]	I/O	20–1000	6.5 CW	1–Tone	28	23.5/900	34	3.2	1894 (PQFN 8x8)
MW6S010NR1[18a]	U	450–1500	10 PEP	2–Tone	28	18/960	32	2.85	1265/1 (TO–270–2)
MW6S010GNR1[18a]	U	450–1500	10 PEP	2–Tone	28	18/960	32	2.85	1265A/1 TO–270–2 Gull)
MW7IC915NT1[18f]	I	700–1000	1.6 AVG	W–CDMA	28	38/880	17.4	3.2	1894/– (PQFN 8x8)
MW7IC930NR1[18a]	I/O	600–1000	3.2 AVG	W–CDMA	28	35.9/940	16.5	1.6	1866/– (TO–270 WBL–16)
MW7IC930GNR1[18a]	I/O	600–1000	3.2 AVG	W–CDMA	28	35.9/940	16.5	1.6	1867/– (TO–270 WBL–16 Gull)
MW7IC930NBR1[18a]	I/O	600–1000	3.2 AVG	W–CDMA	28	35.9/940	16.5	1.6	1329/–(TO–272 WB–16)
MRF8P9040NR1[18a]	I	700–1000	4 AVG	W–CDMA	28	19.9/960	19.1	1.5	1486/1 (TO–270 WB–4)
MRF8P9040GNR1[18a]	I	700–1000	4 AVG	W–CDMA	28	19.9/960	19.1	1.5	1487/1 (TO–270 WB–4 Gull)
MRF8P9040NBR1[18a]	I	700–1000	4 AVG	W–CDMA	28	19.9/960	19.1	1.5	1484/1 (TO–272 WB–4)
MRFE6S9045NR1[18a]	U	450–1000	45 CW	1–Tone	28	20/960	68	1.0	1265/1 (TO–270–2)
MRFE6S9060NR1[18a]	U	450–1100	60 CW	1–Tone	28	20/960	63	0.77	1265/1 (TO–270–2)
MRF6V3090NR1[18a]	I	470–860	18 AVG	OFDM	50	22/860	28.5	0.79	1486/1 (TO–270 WB–4)
MRF8S9200NR3[18i]	I/O	650–1000	58 AVG	W–CDMA	28	19.9/940	37.1	0.30	2021/– (OM780–2)
MRFE6P3300HR3[18i]	I/O	450–860	270 PEP	2–Tone	32	20.4/860	44.8	0.23	375G/1 (NI–860C3)
MRF6VP3450HR6[18o]	I	470–860	450 PEP	2–Tone	50	22.5/860	28	0.27	375D/1 (NI–1230)
MRF6VP3450HSR6[18o]	I	470–860	450 PEP	2–Tone	50	22.5/860	28	0.27	375E/1 (NI–1230S)
To 2000 MHz									
MW6S004NT1[18f]	U	1–2000	4 PEP	2–Tone	28	18/1960	33	8.8	466/1 (PLD 1.5)
MRF6S20010NR1[18a]	I	1600–2200	10 CW	1–Tone	28	15.5/2170	45	5.9	1265/1 (TO–270–2)
MRF6S20010GNR1[18a]	I	1600–2200	10 CW	1–Tone	28	15.5/2170	45	5.9	1265A/1 (TO–270–2 Gull)
MRF7S15100HR3[18i]	I/O	1450–1900	23 AVG	W–CDMA	28	19.5/1510	32	0.74	465/1 (NI–780)
MRF7S15100HSR3[18i]	I/O	1450–1900	23 AVG	W–CDMA	28	19.5/1510	32	0.74	465A/1 (NI–780S)
MRF7S16150HSR3[18i]	I/O	1500–1700	32 AVG	WiMAX	28	19.7/1660	25.4	0.37	465A/1 (NI–780S)
MW7IC18100NR1[18a]	I/O	1750–2100	100 CW	1–Tone	28	30/1990	48	0.51	1618/– (TO–270 WB–14)
MW7IC18100GNR1[18a]	I/O	1750–2100	100 CW	1–Tone	28	30/1990	48	0.51	1621/– (TO–270 WB–14 Gull)
MW7IC18100NBR1[18a]	I/O	1750–2100	100 CW	1–Tone	28	30/1990	48	0.51	1617/– (TO–272 WB–14)
MRF8S19260HR6[18o]	I/O	1700–2000	74 AVG	W–CDMA	30	18.2/1990	34.5	0.30	375I/1 (NI–1230–8)
MRF8S19260HSR6[18o]	I/O	1700–2000	74 AVG	W–CDMA	30	18.2/1990	34.5	0.30	375J/– (NI–1230S–8)
MRF8P18265HR6[18o]	I/O	1600–1900	72 AVG	W–CDMA	30	16/1840	43.7	0.27	375I/1 (NI–1230–8)
MRF8P18265HSR6[18o]	I/O	1600–1900	72 AVG	W–CDMA	30	16/1840	43.7	0.27	375J/1 (NI–1230S–8)

[18]Tape and Reel Packaging Options: a) R1 = 500 units; b) R2 = 2,500 units; c) T1 = 3,000 units; d) T3 = 10,000 units; e) R2 = 1,500 units; f) T1 = 1,000 units; g) R2 = 4,000 units; h) R1 = 1,000 units; i) R3 = 250 units; j) T1 = 500 units; k) R2 = 450 units; l) T1 = 5,000 units; m) R2 = 2,000 units; n) R4 = 100 units; o) R6 = 150 units; p) R5 = 50 units.

[37]U = Unmatched; I = Input; I/O = Input/Output.

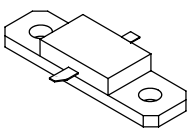
Table 1. Wideband RF Power LDMOS - Class AB (continued)

Product	Frequency Band[37] MHz		P_{out} (Typ) Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
To 3600 MHz									
MRF6S20010NR1[18a]	I	1600-2200	10 CW	1-Tone	28	15.5/2170	45	5.9	1265/1 (TO-270-2)
MRF6S20010GNR1[18a]	I	1600-2200	10 CW	1-Tone	28	15.5/2170	45	5.9	1265A/1 (TO-270-2 Gull)
MRF8S21140HR3[18i]	I/O	1850-2300	34 AVG	W-CDMA	28	17.9/2140	31.7	0.47	465/1 (NI-780)
MRF8S21140HSR3[18i]	I/O	1850-2300	34 AVG	W-CDMA	28	17.9/2140	31.7	0.47	465A/1 (NI-780S)
MRF6S27015NR1[18a]	I	2000-2700	15 CW	W-CDMA	28	14/2700	45	2.0	1265/1 (TO-270-2)
MRF6S27015GNR1[18a]	I	2000-2700	3 AVG	W-CDMA	28	14/2600	22	2.2	1265A/1 (TO-270-2 Gull)
MW7IC2725NR1[18a]	I/O	2500-2700	4 AVG	WiMAX	28	28.5/2700	17	1.4	1886/- (TO-270 WB-16)
MW7IC2725GNR1[18a]	I/O	2500-2700	4 AVG	WiMAX	28	28.5/2700	17	1.4	1887/- (TO-270 WB-16 Gull)
MW7IC2725NBR1[18a]	I/O	2500-2700	4 AVG	WiMAX	28	28.5/2700	17	1.4	1329/- (TO-272 WB-16)
MW7IC2750NR1[18a]	I/O	2300-2700	8 AVG	WiMAX	28	26/2700	17	0.7	1618/- (TO-270 WB-14)
MW7IC2750GNR1[18a]	I/O	2300-2700	8 AVG	WiMAX	28	26/2700	17	0.7	1621/- (TO-270 WB-14 Gull)
MW7IC2750NBR1[18a]	I/O	2300-2700	8 AVG	WiMAX	28	26/2700	17	0.7	1617/- (TO-272 WB-14)
MRF6S27085HR3[18i]	I/O	2600-2700	85 CW	1-Tone	28	15.5/2700	48	0.50	465/1 (NI-780)
MRF6S27085HSR3[18i]	I/O	2600-2700	85 CW	1-Tone	28	15.5/2700	48	0.50	465A/1 (NI-780S)
MRF6P27160HR6[18o]	I/O	2600-2700	160 CW	1-Tone	28	14.6/2700	48	0.29	375D/1 (NI-1230)
MW7IC3825NR1[18a]	I/O	3400-3600	5 AVG	WiMAX	28	25/3600	15	1.3	1886/- (TO-270 WB-16)
MW7IC3825GNR1[18a]	I/O	3400-3600	5 AVG	WiMAX	28	25/3600	15	1.3	1887/- (TO-270 WB-16 Gull)
MW7IC3825NBR1[18a]	I/O	3400-3600	5 AVG	WiMAX	28	25/3600	15	1.3	1329/- (TO-272 WB-16)

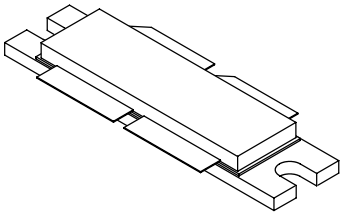
[18]Tape and Reel Packaging Options: a) R1 = 500 units; b) R2 = 2,500 units; c) T1 = 3,000 units; d) T3 = 10,000 units; e) R2 = 1,500 units; f) T1 = 1,000 units; g) R2 = 4,000 units; h) R1 = 1,000 units; i) R3 = 250 units; j) T1 = 500 units; k) R2 = 450 units; l) T1 = 5,000 units; m) R2 = 2,000 units; n) R4 = 100 units; o) R6 = 150 units; p) R5 = 50 units.

[37]U = Unmatched; I = Input; I/O = Input/Output.

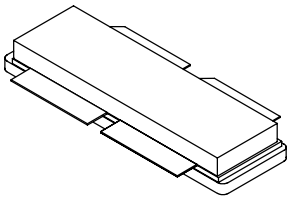
RF Transistor Packages



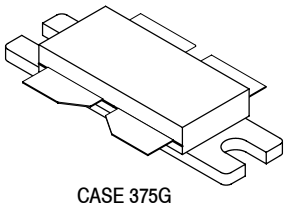
CASE 360D
STYLE 1
(NI-360HF)



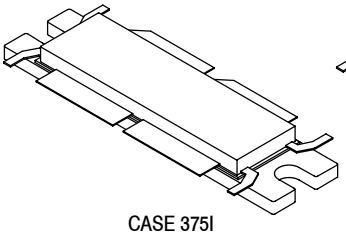
CASE 375D
STYLE 1
(NI-1230)



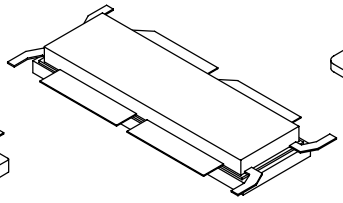
CASE 375E
STYLE 1
(NI-1230S)



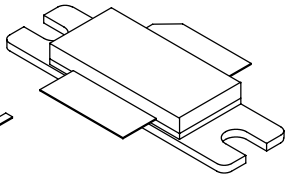
CASE 375G
STYLE 1
(NI-860C3)



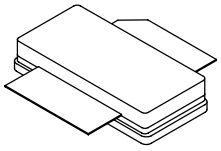
CASE 375I
(NI-1230-8)



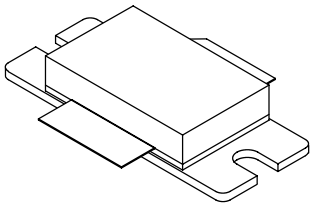
CASE 375J
(NI-1230S-8)



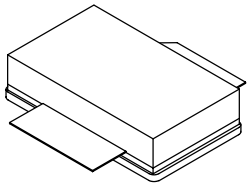
CASE 465
STYLE 1
(NI-780)



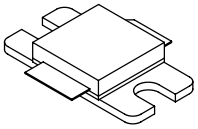
CASE 465A
STYLE 1
(NI-780S)



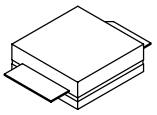
CASE 465B
STYLE 1
(NI-880)



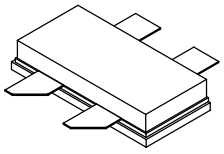
CASE 465C
STYLE 1
(NI-880S)



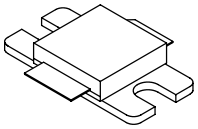
CASE 465E
STYLE 1
(NI-400)



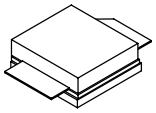
CASE 465F
STYLE 1
(NI-400S)



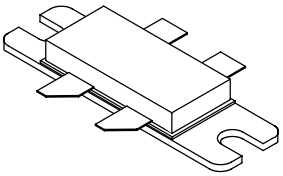
CASE 465H
STYLE 1
(NI-780S-4)



CASE 465I
STYLE 1
(NI-400-240)



CASE 465J
STYLE 1
(NI-400S-240)

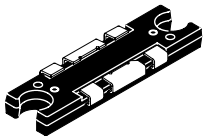


CASE 465M
STYLE 1
(NI-780-4)

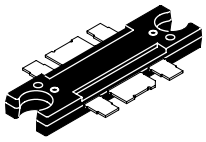
SCALE 1:1

RF Transistor Packages (continued)

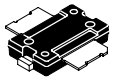
CASE 466
STYLE 1
PLASTIC
(PLD-1.5)



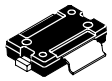
CASE 1264
STYLE 1
PLASTIC
(TO-272-6 Wrap)



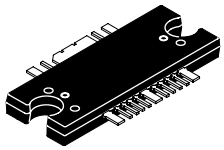
CASE 1264A
STYLE 1
PLASTIC
(TO-272-6)



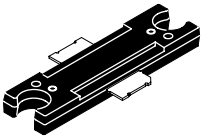
CASE 1265
STYLE 1
PLASTIC
(TO-270-2)



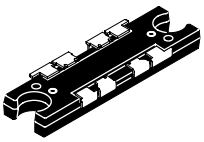
CASE 1265A
STYLE 1
PLASTIC
(TO-270-2 Gull)



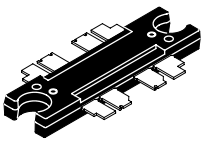
CASE 1329
STYLE 1
PLASTIC
(TO-272 WB-16)



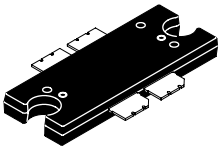
CASE 1337
STYLE 1
PLASTIC
(TO-272-2)



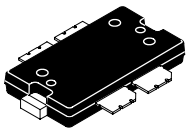
CASE 1366
STYLE 1
PLASTIC
(TO-272-8 Wrap)



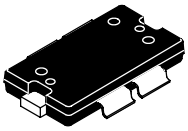
CASE 1366A
STYLE 1
PLASTIC
(TO-272-8)



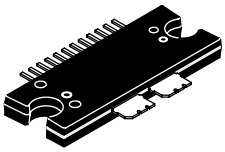
CASE 1484
STYLE 1
PLASTIC
(TO-272 WB-4)



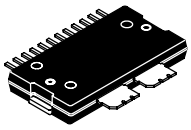
CASE 1486
STYLE 1
PLASTIC
(TO-270 WB-4)



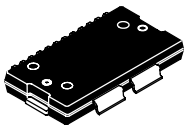
CASE 1487
STYLE 1
PLASTIC
(TO-270 WB-4 Gull)



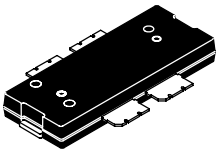
CASE 1617
PLASTIC
(TO-272 WB-14)



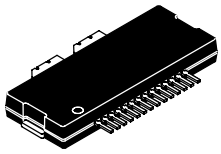
CASE 1618
PLASTIC
(TO-270 WB-14)



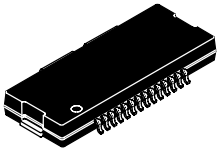
CASE 1621
PLASTIC
(TO-270 WB-14 Gull)



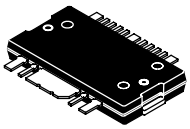
CASE 1730
PLASTIC
(TO-270 WBL-4)



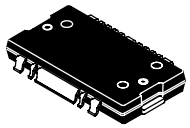
CASE 1866
PLASTIC
(TO-270 WBL-16)



CASE 1867
PLASTIC
(TO-270 WBL-16 Gull)

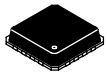


CASE 1886
PLASTIC
(TO-270 WB-16)



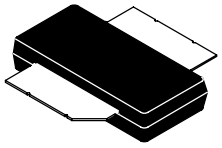
CASE 1887
PLASTIC
(TO-270 WB-16 Gull)

CASE 1894
PLASTIC
(PQFN 8x8)



SCALE 2:1

CASE 1898
PLASTIC
(QFN 4x4)



CASE 2021
PLASTIC
(OM-780-2)

SCALE 1:1

RF Power LDMOS Amplifier ICs

Freescale Semiconductor's RF portfolio includes IC designs optimized for wideband applications. For PA designers, IC driver devices offer the benefits of multiple gain stages in one package with most of the decoupling and matching circuitry incorporated into a single low-cost plastic device.

Table of Contents

RF Power LDMOS Amplifier ICs

Complete amplifiers with 50 ohm input impedances are available for all popular base station transmitter systems, including GSM, GSM/EDGE, CDMA, W-CDMA, WiMAX and LTE covering frequencies from 748 MHz up to 3600 MHz.

Designed for applications such as macrocell drivers and microcell output stage, these Class AB amplifiers are ideal for base station systems with power requirements up to 120 watts.

Table 1. Cellular - To 1000 MHz - Class AB

Product	Frequency Band[37] MHz		P_{out} (Typ) Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
MDE6IC7120GNR1[18a]	I/O	728-768	25 AVG	W-CDMA	28	34.4/748	40.6	0.90	1866/- (TO-270 WBL-16)
MDE6IC7120NR1[18a]	I/O	728-768	25 AVG	W-CDMA	28	34.4/748	40.6	0.90	1867/- (TO-270 WBL-16 Gull)
MW7IC915NT1[18f]	I	865-895	1.6 AVG	W-CDMA	28	38/880	17.4	3.2	1894/- (PQFN 8x8)
MW7IC930NR1[18a]	I/O	920-960	3.2 AVG	W-CDMA	28	35.9/940	16.5	1.6	1866/- (TO-270 WBL-16)
MW7IC930GNR1[18a]	I/O	920-960	3.2 AVG	W-CDMA	28	35.9/940	16.5	1.6	1867/- (TO-270 WBL-16 Gull)
MW7IC930NBR1[18a]	I/O	920-960	3.2 AVG	W-CDMA	28	35.9/940	16.5	1.6	1329/-(TO-272 WB-16)
MD8IC970NR1[18a]	I/O	850-940	35 AVG	2-Tone	28	32.6/940	42.1	0.6	1866/- (TO-270 WBL-16)
MD8IC970GNR1[18a]★	I/O	850-940	35 AVG	2-Tone	28	32.6/940	42.1	0.6	1867/- (TO-270 WBL-16 Gull)
MWE6IC9080NR1[18a]	I/O	865-960	80 CW	1-Tone	28	28.5/960	52.3	0.52	1618/- (TO-270 WB-14)
MWE6IC9080GNR1[18a]	I/O	865-960	80 CW	1-Tone	28	28.5/960	52.3	0.52	1621/- (TO-270 WB-14 Gull)
MWE6IC9080NBR1[18a]	I/O	865-960	80 CW	1-Tone	28	28.5/960	52.3	0.52	1617/- (TO-272 WB-14)
MWE6IC9100NBR1[18a]	I	869-960	100 CW	1-Tone	26	33.5/960	54	0.38	1617/- (TO-272 WB-14)
MDE6IC9120NR1[18a]	I/O	920-960	25 AVG	W-CDMA	28	32/940	38	1.3	1866/- (TO-270 WBL-16)
MDE6IC9120GNR1[18a]	I/O	920-960	25 AVG	W-CDMA	28	32/940	38	1.3	1867/- (TO-270 WBL-16 Gull)

Table 2. Cellular - To 2100 MHz - Class AB

Product	Frequency Band[37] MHz		P_{out} (Typ) Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
MW6IC2015NBR1[18a]	I	1805-1990	15 PEP	2-Tone	26	26/1930	28	1.2	1329/- (TO-272 WB-16)
MW7IC18100NR1[18a]	I/O	1805-2050	100 CW	1-Tone	28	30/1990	48	0.51	1618/- (TO-270 WB-14)
MW7IC18100GNR1[18a]	I/O	1805-2050	100 CW	1-Tone	28	30/1990	48	0.51	1621/- (TO-270 WB-14 Gull)
MW7IC18100NBR1[18a]	I/O	1805-2050	100 CW	1-Tone	28	30/1990	48	0.51	1617/- (TO-272 WB-14)
MD7IC18120NR1[18a]	I/O	1805-1880	30 AVG	W-CDMA	28	25.8/1880	35.3	0.88	1866/- (TO-270 WBL-16)
MD7IC18120GNR1[18a]	I/O	1805-1880	30 AVG	W-CDMA	28	25.8/1880	35.3	0.88	1867/- (TO-270 WBL-16 Gull)
MW6IC1940NBR1[18a]	I/O	1920-2000	4.5 AVG	W-CDMA	28	28.5/1920	13.5	1.2	1329/- (TO-272 WB-16)
MW7IC2020N[46c]	I/O	1805-1880	2.4 AVG	W-CDMA	28	31.8/1880	16.8	—	1894/- (PQFN 8x8)
MW7IC2040NR1[18a]	I/O	1930-1990	4 AVG	W-CDMA	28	32/1930	17.5	1.5	1866/- (TO-270 WBL-16)
MW7IC2040GNR1[18a]	I/O	1930-1990	4 AVG	W-CDMA	28	32/1930	17.5	1.5	1867/- (TO-270 WBL-16 Gull)
MW7IC2040NBR1[18a]	I/O	1930-1990	4 AVG	W-CDMA	28	32/1930	17.5	1.5	1329/- (TO-272 WB-16)
MD7IC2050NR1[18a]	I/O	1880-2025	10 AVG	W-CDMA	28	30.5/2025	34.7	1.9	1618/- (TO-270 WB-14)
MD7IC2050GNR1[18a]	I/O	1880-2025	10 AVG	W-CDMA	28	30.5/2025	34.7	1.9	1621/- (TO-270 WB-14 Gull)
MD7IC2050NBR1[18a]	I/O	1880-2025	10 AVG	W-CDMA	28	30.5/2025	34.7	1.9	1617/- (TO-272 WB-14)

[18]Tape and Reel Packaging Options: a) R1 = 500 units; b) R2 = 2,500 units; c) T1 = 3,000 units; d) T3 = 10,000 units; e) R2 = 1,500 units; f) T1 = 1,000 units; g) R2 = 4,000 units; h) R1 = 1,000 units; i) R3 = 250 units; j) T1 = 500 units; k) R2 = 450 units; l) T1 = 5,000 units; m) R2 = 2,000 units; n) R4 = 100 units; o) R6 = 150 units; p) R5 = 50 units.

[37]U = Unmatched; I = Input; I/O = Input/Output.

[46]To be introduced: a) 2Q11; b) 3Q11; c) 4Q11; d) 1Q12.

★New Product

Table 3. Cellular – To 2200 MHz – Class AB

Product	Frequency Band[37] MHz		P_{out} (Typ) Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
MW7IC2020N[46c]	I/O	2110–2170	2.4 AVG	W-CDMA	28	32.4/2170	16.7	—	1894/- (PQFN 8x8)
MW7IC2220NR1[18a]	I/O	2110–2170	2 AVG	W-CDMA	28	31/2170	13	1.5	1886/- (TO-270 WB-16)
MW7IC2220GNR1[18a]	I/O	2110–2170	2 AVG	W-CDMA	28	31/2170	13	1.5	1887/- (TO-270 WB-16 Gull)
MW7IC2220NBR1[18a]	I/O	2110–2170	2 AVG	W-CDMA	28	31/2170	13	1.5	1329/- (TO-272 WB-16)
MW7IC2240NR1[18a]	I/O	2110–2170	4 AVG	W-CDMA	28	30/2110	14	1.3	1886/- (TO-270 WB-16)
MW7IC2240GNR1[18a]	I/O	2110–2170	4 AVG	W-CDMA	28	30/2110	14	1.3	1887/- (TO-270 WB-16 Gull)
MW7IC2240NBR1[18a]	I/O	2110–2170	4 AVG	W-CDMA	28	30/2110	14	1.3	1329/- (TO-272 WB-16)
MD7IC2250NR1[18a]	I/O	2110–2170	5.3 AVG	W-CDMA	28	31.1/2170	16.8	1.1	1618/- (TO-270 WB-14)
MD7IC2250GNR1[18a]	I/O	2110–2170	5.3 AVG	W-CDMA	28	31.1/2170	16.8	1.1	1621/- (TO-270 WB-14 Gull)
MD7IC2250NBR1[18a]	I/O	2110–2170	5.3 AVG	W-CDMA	28	31.1/2170	16.8	1.1	1617/- (TO-272 WB-14)
MD7IC21100NR1[18a]	I/O	2110–2170	32 AVG	W-CDMA	28	28.5/2170	30	0.7	1618/- (TO-270 WB-14)
MD7IC21100GNR1[18a]	I/O	2110–2170	32 AVG	W-CDMA	28	28.5/2170	30	0.7	1621/- (TO-270 WB-14 Gull)
MD7IC21100NBR1[18a]	I/O	2110–2170	32 AVG	W-CDMA	28	28.5/2170	30	0.7	1617/- (TO-272 WB-14)

Table 4. Cellular – To 3600 MHz – Class AB

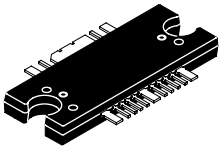
Product	Frequency Band[37] MHz		P_{out} (Typ) Watts	Test Signal	V_{DD} Volts	Gain (Typ)/Freq. dB/MHz	Eff. (Typ) %	θ_{JC} °C/W	Pkg/Style
MW7IC2725NR1[18a]	I/O	2500–2700	4 AVG	WiMAX	28	28.5/2700	17	1.4	1886/- (TO-270 WB-16)
MW7IC2725GNR1[18a]	I/O	2500–2700	4 AVG	WiMAX	28	28.5/2700	17	1.4	1887/- (TO-270 WB-16 Gull)
MW7IC2725NBR1[18a]	I/O	2500–2700	4 AVG	WiMAX	28	28.5/2700	17	1.4	1329/- (TO-272 WB-16)
MW7IC2750NR1[18a]	I/O	2500–2700	8 AVG	WiMAX	28	26/2700	17	0.7	1618/- (TO-270 WB-14)
MW7IC2750GNR1[18a]	I/O	2500–2700	8 AVG	WiMAX	28	26/2700	17	0.7	1621/- (TO-270 WB-14 Gull)
MW7IC2750NBR1[18a]	I/O	2500–2700	8 AVG	WiMAX	28	26/2700	17	0.7	1617/- (TO-272 WB-14)
MD7IC2755NR1[18a]	I/O	2500–2700	10 AVG	WiMAX	28	25/2700	25	1.8	1618/- (TO-270 WB-14)
MD7IC2755GNR1[18a]	I/O	2500–2700	10 AVG	WiMAX	28	25/2700	25	1.8	1621/- (TO-270 WB-14 Gull)
MW7IC3825NR1[18a]	I/O	3400–3600	5 AVG	WiMAX	28	25/3600	15	1.3	1886/- (TO-270 WB-16)
MW7IC3825GNR1[18a]	I/O	3400–3600	5 AVG	WiMAX	28	25/3600	15	1.3	1887/- (TO-270 WB-16 Gull)
MW7IC3825NBR1[18a]	I/O	3400–3600	5 AVG	WiMAX	28	25/3600	15	1.3	1329/- (TO-272 WB-16)

[18]Tape and Reel Packaging Options: a) R1 = 500 units; b) R2 = 2,500 units; c) T1 = 3,000 units; d) T3 = 10,000 units; e) R2 = 1,500 units; f) T1 = 1,000 units; g) R2 = 4,000 units; h) R1 = 1,000 units; i) R3 = 250 units; j) T1 = 500 units; k) R2 = 450 units; l) T1 = 5,000 units; m) R2 = 2,000 units; n) R4 = 100 units; o) R6 = 150 units; p) R5 = 50 units.

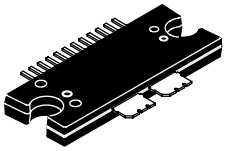
[37]U = Unmatched; I = Input; I/O = Input/Output.

[46]To be introduced: a) 2Q11; b) 3Q11; c) 4Q11; d) 1Q12.

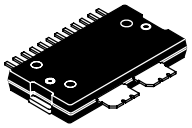
RF Power LDMOS Amplifier ICs Packages



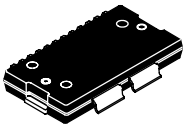
CASE 1329
STYLE 1
PLASTIC
(TO-272 WB-16)



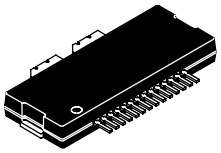
CASE 1617
PLASTIC
(TO-272 WB-14)



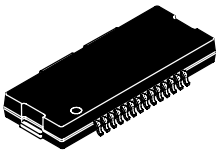
CASE 1618
PLASTIC
(TO-270 WB-14)



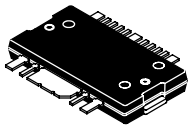
CASE 1621
PLASTIC
(TO-270 WB-14 Gull)



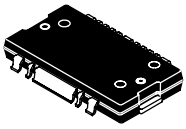
CASE 1866
PLASTIC
(TO-270 WBL-16)



CASE 1867
PLASTIC
(TO-270 WBL-16 Gull)



CASE 1886
PLASTIC
(TO-270 WB-16)



CASE 1887
PLASTIC
(TO-270 WB-16 Gull)

CASE 1894
PLASTIC
(PQFN 8x8)

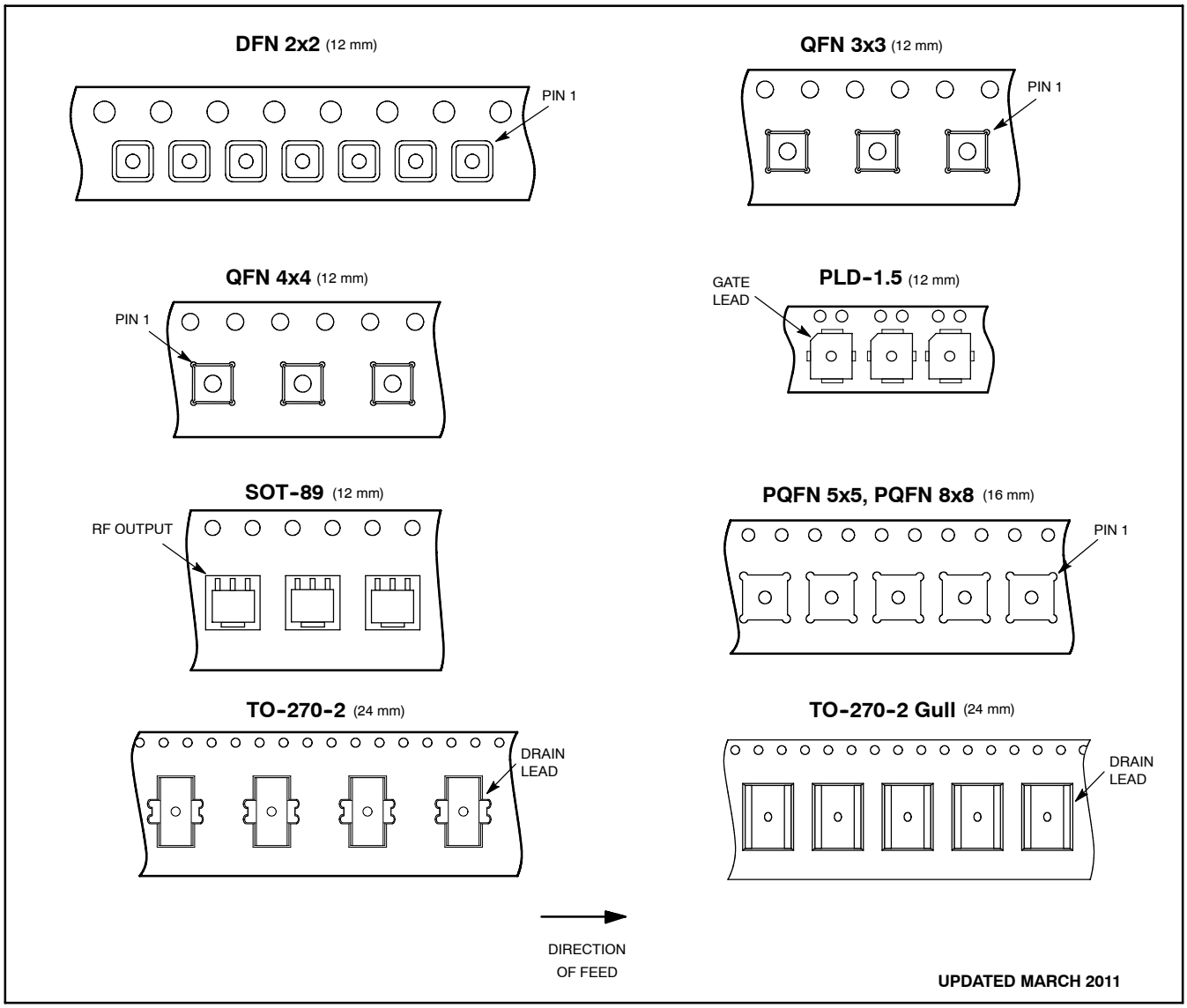
SCALE 1:1

RF Tape and Reel Specifications

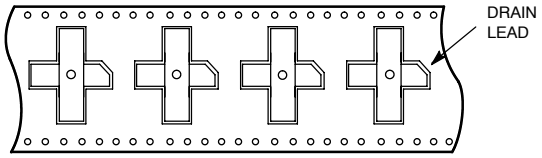
Embossed Tape and Reel is used to facilitate automatic pick and place equipment feed requirements. The tape is used as the shipping container for various products and requires a minimum of handling. The antistatic/conductive tape provides a secure cavity for the product when sealed with the “peel-back” cover tape.

- Two Reel Sizes Available (7″ and 13″)
- Used for Automatic Pick and Place Feed Systems
- Minimizes Product Handling
- EIA 481, -1, -2
- SOT-363 in 8 mm Tape
- DFN 2x2, PLD-1.5, QFN 3x3, QFN 4x4, SOT-89 in 12 mm Tape
- PQFN 5x5, PQFN 8x8 in 16 mm Tape
- TO-270-2, TO-270-2 Gull in 24 mm Tape
- NI-360HF, NI-400, NI-400S, NI-400-240, NI-400S-240, NI-780S-4, OM-780-2, TO-270 WB-4 Gull in 32 mm Tape
- TO-270 WB-4, TO-270 WBL-4, TO-270 WB-14, TO-270 WB-14 Gull, TO-270 WB-16, TO-270 WB-16 Gull, TO-270 WBL-16, TO-272-2, TO-272-6, TO-272-6 Wrap, TO-272-8, TO-272-8 Wrap, TO-272 WB-4, TO-272 WB-14, TO-272 WB-16, TO-272 WB-16 Gull in 44 mm Tape
- NI-780, NI-780S, NI-780-4, NI-860, NI-880, NI-880S, NI-1230, NI-1230S, NI-1230-8, NI-1230S-8 in 56 mm Tape

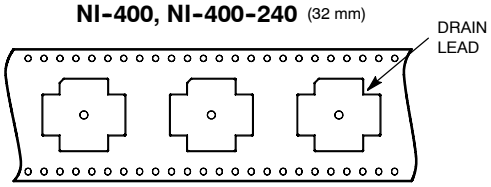
Use the standard device title and add the required suffix as listed in the option table on the following page. Note that the individual reels have a finite number of devices depending on the type of product contained in the tape. Also note the minimum lot size is one full reel for each line item, and orders are required to be in increments of the single reel quantity.



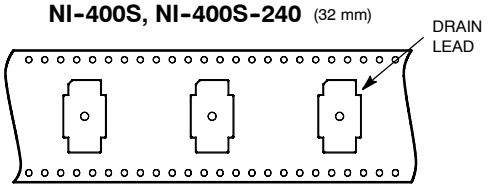
NI-360HF (32 mm)



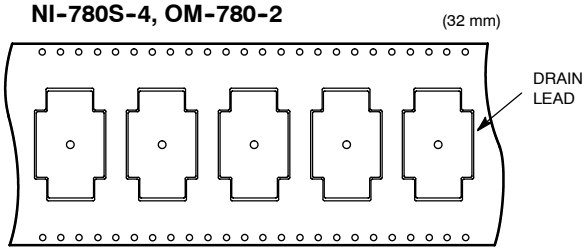
NI-400, NI-400-240 (32 mm)



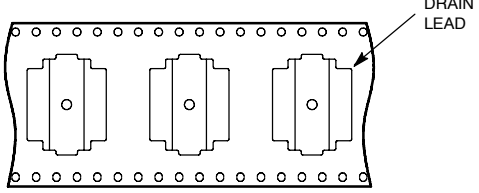
NI-400S, NI-400S-240 (32 mm)



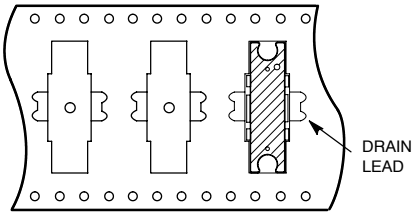
NI-780S-4, OM-780-2 (32 mm)



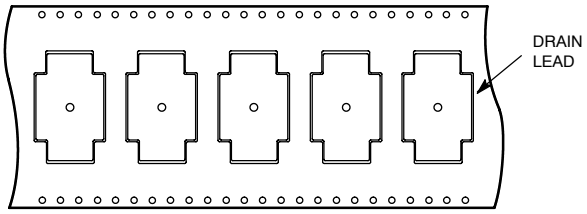
TO-270 WB-4 Gull (32 mm)



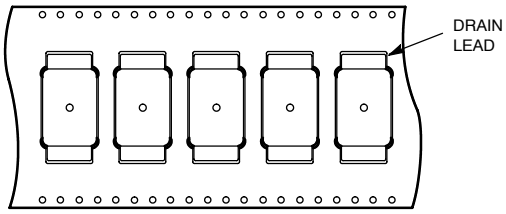
TO-272-2, TO-272-6 Wrap, TO-272-6, TO-272-8, TO-272-8 Wrap (44 mm)

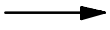


TO-270 WB-4, TO-270 WBL-4, TO-270 WB-14, TO-270 WB-16, TO-270 WBL-16, TO-272 WB-4, TO-272 WB-14, TO-272 WB-16 (44 mm)



TO-270 WB-14 Gull, TO-270 WB-16 Gull, TO-272 WB-16 Gull (44 mm)

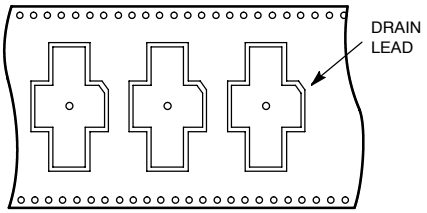




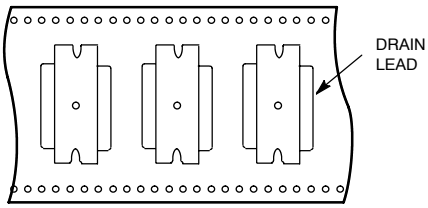
DIRECTION
OF FEED

,

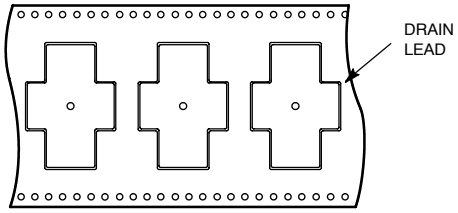
NI-780, NI-780S, NI-780-4 (56 mm)



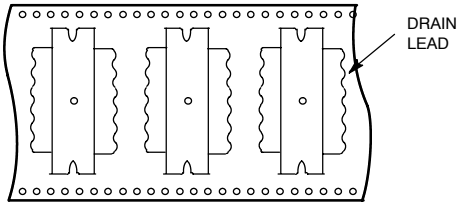
NI-860 (56 mm)



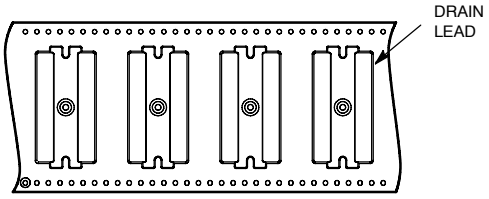
NI-880, NI-880S (56 mm)



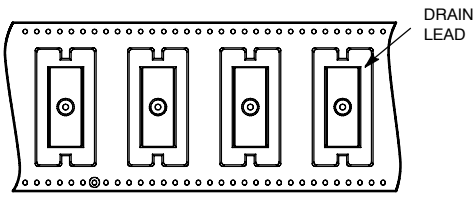
NI-1230, NI-1230S (56 mm)



NI-1230-8 (56 mm)



NI-1230S-8 (56 mm)



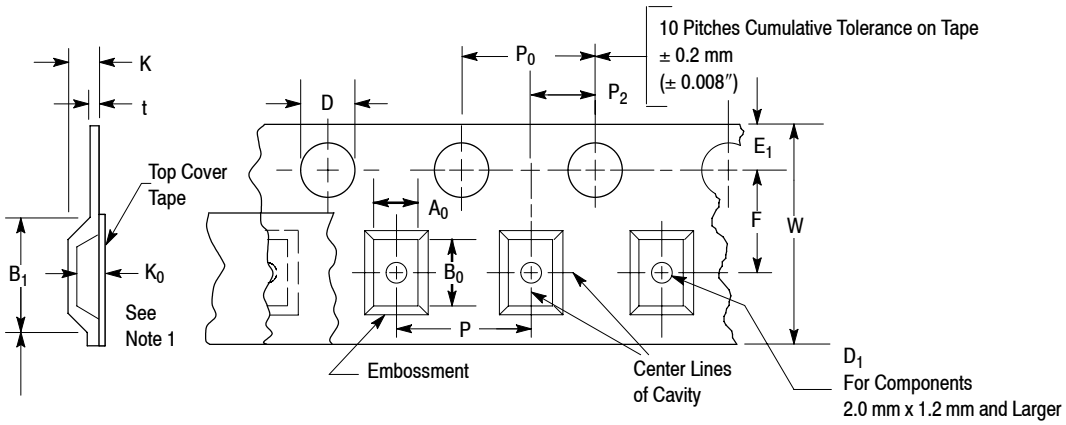
DIRECTION
OF FEED

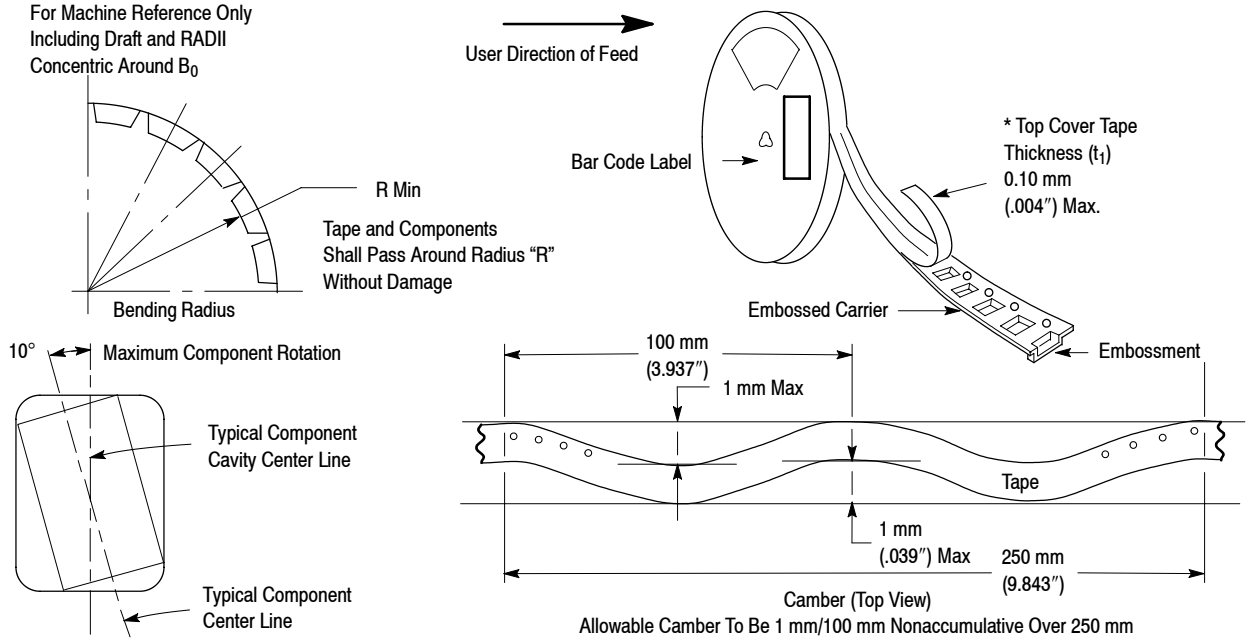
RF EMBOSSED TAPE AND REEL ORDERING INFORMATION

Package	Tape Width (mm)	Pitch mm (inch)	Reel Size mm (inch)	Devices Per Reel and Minimum Order Quantity	Device Suffix
DFN 2x2 (2132)	12	8.0 ± 0.1 (.315 ± .004)	178 (7)	1,000	T1
NI-360HF (360D)	32	24.0 ± 0.1 (.945 ± .004)	330 (13)	500	R1
	32	24.0 ± 0.1 (.945 ± .004)	330 (13)	50	R5
NI-400 (465E)	32	32.0 ± 0.1 (1.26 ± .004)	330 (13)	250	R3
NI-400S (465F)	32	32.0 ± 0.1 (1.26 ± .004)	330 (13)	250	R3
NI-400-240 (465I)	32	32.0 ± 0.1 (1.26 ± .004)	330 (13)	250	R3
NI-400S-240 (465J)	32	32.0 ± 0.1 (1.26 ± .004)	330 (13)	250	R3
NI-780 (465)	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	250	R3
NI-780S (465A)	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	250	R3
NI-780-4 (465M)	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	250	R3
NI-780S-4 (465H)	32	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
NI-860 (375G)	56	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
	56	28.0 ± 0.1 (1.10 ± .004)	330 (13)	50	R5
NI-880 (465B)	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	250	R3
NI-880S (465C)	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	250	R3
NI-1230 (375D)	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	150	R6
NI-1230S (375E)	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	150	R6
NI-1230-8 (375I)	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	150	R6
NI-1230S-8 (375J)	56	32.0 ± 0.1 (1.26 ± .004)	330 (13)	150	R6
OM-780-2 (2021)	32	28.0 ± 0.1 (1.10 ± .004)	330 (13)	250	R3
PLD-1.5 (466)	12	8.0 ± 0.1 (.315 ± .004)	178 (7)	1,000	T1
	12	8.0 ± 0.1 (.315 ± .004)	178 (7)	100	R4
PQFN 5x5 (1543)	16	8.0 ± 0.1 (.315 ± .004)	330 (13)	1,000	T1
PQFN 8x8 (1894)	16	12.0 ± 0.1 (.472 ± .004)	330 (13)	1,000	T1
QFN 3x3 (2131)	12	8.0 ± 0.1 (.315 ± .004)	178 (7)	1,000	T1
QFN 4x4 (1898)	12	8.0 ± 0.1 (.315 ± .004)	330 (13)	1,000	T1
SOT-89 (1514)	12	8.0 ± 0.1 (.315 ± .004)	178 (7)	1,000	T1
SOT-89 (2142)	12	8.0 ± 0.1 (.315 ± .004)	180 (7)	1,000	T1
SOT-363	8	4.0 ± 0.1 (.157 ± .004)	178 (7)	3,000	T1
TO-270-2 (1265)	24	16.0 ± 0.1 (.631 ± .004)	330 (13)	500	R1
TO-270-2 Gull (1265A)	24	12.0 ± 0.1 (.471 ± .004)	330 (13)	500	R1
TO-270 WB-4 (1486)	44	20.0 ± 0.1 (.788 ± .004)	330 (13)	500	R1
TO-270 WBL-4 (1730)	44	20.0 ± 0.1 (.788 ± .004)	330 (13)	500	R1
TO-270 WB-4 Gull (1487)	32	24.0 ± 0.1 (.945 ± .004)	330 (13)	500	R1
TO-270 WB-14 (1618)	44	20.0 ± 0.1 (.788 ± .004)	330 (13)	500	R1
TO-270 WB-14 Gull (1621)	44	16.0 ± 0.1 (.631 ± .004)	330 (13)	500	R1
TO-270 WB-16 (1886)	44	20.0 ± 0.1 (.788 ± .004)	330 (13)	500	R1
TO-270 WB-16 Gull (1887)	44	16.0 ± 0.1 (.631 ± .004)	330 (13)	500	R1
TO-270 WBL-16 (1866)	44	24.0 ± 0.1 (.945 ± .004)	330 (13)	500	R1
TO-272-2 (1337)	44	16.0 ± 0.1 (.631 ± .004)	330 (13)	500	R1
TO-272-6 (1264A)	44	20.0 ± 0.1 (.631 ± .004)	330 (13)	500	T1
TO-272-6 Wrap (1264)	44	20.0 ± 0.1 (.631 ± .004)	330 (13)	500	T1
TO-272-8 (1366A)	44	20.0 ± 0.1 (.787 ± .004)	330 (13)	500	T1
TO-272-8 Wrap (1366)	44	20.0 ± 0.1 (.787 ± .004)	330 (13)	500	T1
TO-272 WB-4 (1484)	44	20.0 ± 0.1 (.788 ± .004)	330 (13)	500	R1
TO-272 WB-14 (1617)	44	20.0 ± 0.1 (.788 ± .004)	330 (13)	500	R1
TO-272 WB-16 (1329)	44	20.0 ± 0.1 (.788 ± .004)	330 (13)	500	R1

EMBOSSED TAPE AND REEL DATA FOR DISCRETES

CARRIER TAPE SPECIFICATIONS





DIMENSIONS

Tape Size	B_1 Max	D	D_1	E_1	F	K	P_0	P_2	R Min	t Max	W
12 mm	8.2 mm (.323″)	1.5 + 0.1 mm - 0.0 (.059 + .004″ - 0.0)	1.5 mm Min (.060″)	1.75 ± 0.1 mm (.069 ± .004″)	5.5 ± 0.05 mm (.217 ± .002″)	6.4 mm Max (.252″)	4.0 ± 0.1 mm (.157 ± .004″)	2.0 ± 0.1 mm (.079 ± .004″)	30 mm (1.18″)	0.4 mm (.016″)	12 mm (.470″)
	4.0 mm (.157″) DFN 2x2 QFN 3x3					1.2 mm Max (.048″)		2.0 ± 0.5 mm (.079 ± .002″)		0.30 mm (.012″)	
	4.45 mm (.175″) QFN 4x4										
	5.1 mm (.201″) SOT-89 (1543)		1.7 mm Min (.068″) SOT-89 (1543)			1.9 mm Max (.076″) SOT-89 (1543)					12 mm (.470″) SOT-89
	- SOT-89 (2142)		1.5 mm Min (0.059″) SOT-89 (2142)		5.5 ± 0.1 mm (.217 ± .004″) SOT-89 (2142)	2.0 mm Max (.079″) SOT-89 (2142)		2.0 ± 0.1 mm (.079 ± .004″) SOT-89 (2142)			
16 mm	12.1 mm (.476″)		1.5 mm Min (.060″)		7.5 ± 0.10 mm (.295 ± .004″)	7.9 mm Max (.311″)		2.0 ± 0.1 mm (.079 ± .004″)	30 mm (1.18″)	0.4 mm (.016″)	16 mm (.642″)
	6.1 mm (.241″) PQFN 5x5					2.8 mm Max (.110″) PQFN 5x5	4.0 ± 0.2 mm (.157 ± .001″) PQFN 5x5	2.0 ± 0.5 mm (.079 ± .002″) PQFN 5x5		0.30 mm (.012″) PQFN 5x5 PQFN 8x8	
	8.4 mm (.331″) PQFN 8x8					2.4 mm Max (.094″) PQFN 8x8	4.0 ± 0.1 mm (.157 ± .004″)	2.0 ± 0.1 mm (.079 ± .004″)			
24 mm	20.1 mm (.791″)				11.5 ± 0.1 mm (.453 ± .004″)	11.9 mm Max (.468″)				0.4 mm (.016″)	24.3 mm (.957″)
	11.1 mm (.437″) TO-270-2 Gull					2.82 mm Max (.111″) TO-270-2 Gull				0.338 mm (.013″) TO-270-2 Gull	
32 mm	23.0 mm (.906″)		1.5 mm Min (.059″)		14.2 ± 0.1 mm (.559 ± .004″)	4.6 mm (.181″) NI-360/HF/S			50 mm (1.969″)	0.6 mm (.024″)	32.2 mm (1.272″)
	21 mm (.827″) NI-780S-4 OM-780-2		2.0 mm Min (.079″)			5.1 mm Max (.201″) NI-780S-4 OM-780-2				0.3 mm (.012″)	32 mm (1.26″)
	18 mm (.709″) NI-400 NI-400-240 NI-400S NI-400S-240	1.50 ± 0.1 mm - 0.0 (.061 + .002″ - 0.0)				3.7 mm (.146″) NI-400 NI-400-240 NI-400S NI-400S-240					
32 mm	19.7 mm (.776″) TO-270 WB-4 Gull					3.5 mm (.138″) TO-270 WB-4 Gull					

Metric dimensions govern — English are in parentheses for reference only.

NOTE 1: A_0, B_0, and K_0 are determined by component size. The clearance between the components and the cavity must be within .05 mm min. to .50 mm max., the component cannot rotate more than 10° within the determined cavity.

NOTE 2: Pitch information is contained in the Embossed Tape and Reel Ordering Information on pg. 32.

(continued)

DIMENSIONS (continued)

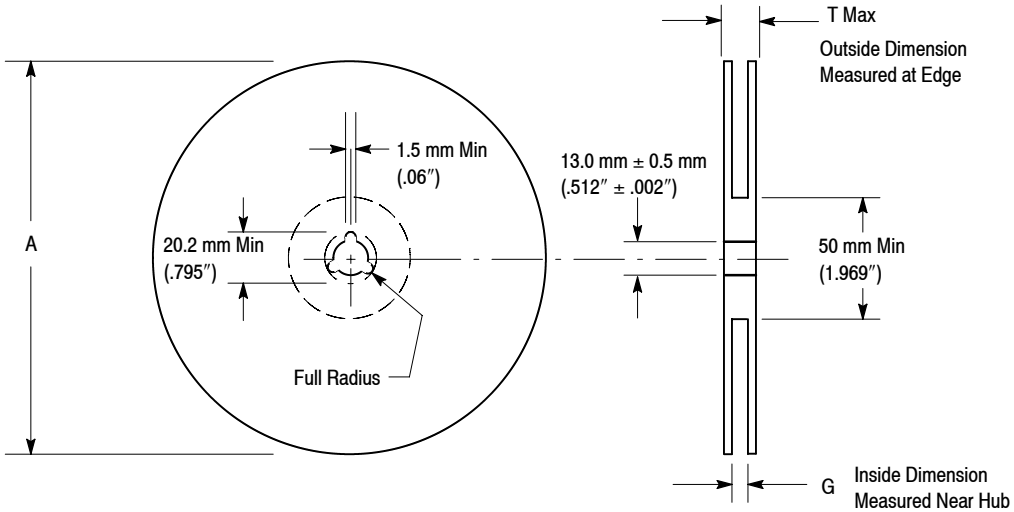
Tape Size	B_1 Max	D	D_1	E_1	F	K	P_0	P_2	R Min	t Max	W Max
44 mm	35.0 mm (1.378″)	1.5 + 0.1 mm - 0.0 (.059 + .004″ - 0.0)	2.0 mm Min (.079″)	1.75 ± 0.1 mm (.069 ± .004″)	11.5 ± 0.1 mm (.453 ± .004″)	15.9 mm Max (.625″)	4.0 ± 0.1 mm (.157 ± .004″)	2.0 ± 0.15 mm (.079 ± .006″)	50 mm (1.969″)	0.6 mm (.024″)	44 mm (1.732″)
	24.0 mm (.946″) TO-270 WBL-4, TO-272 WB-4, TO-270 WB-14, TO-270 WB-16, TO-272 WB-14, TO-272 WB-16				20.2+ 0.15 mm (0.795± .006″)	2.92 mm (.115″) TO-272 WB-4, TO-272 WB-16	20.0± 0.1 mm (.788 ± .004″) TO-272 WB-4, TO-272 WB-16			.318 mm (.012″) TO-272 WB-4, TO-272 WB-16	
	23.77 mm (.936″) TO-270 WB-14 Gull, TO-270 WB-16 Gull TO-272 WB-16 Gull					3.20 mm (.126″) TO-272 WB-16 Gull	16.0± 0.1 mm (.630 ± .004″) TO-272 WB-16 Gull			.343 mm (.013″) TO-272 WB-16 Gull	
	25.8 ± 0.1 mm (1.016 ± .004″) TO-270 WBL-16					4.2 ± 0.1 mm (0.165 ± .004″) TO-270 WBL-16	24.0 ± 0.1 mm (.945 ± .004″) TO-270 WBL-16			0.32 mm (.024″) TO-270 WBL-16	
56 mm	34.7 mm (1.366″) NI-780/S NI-860 NI-880/S				26.2 ± 0.15 mm (1.031 ± .006″) NI-780/S NI-860 NI-880/S	4.5 mm (0.177″) NI-780/S	4.0 ± 0.1 mm (.157 ± .004″)	2.0 ± 0.15 mm (.079 ± .006″) NI-780/S NI-860 NI-880/S		0.6 mm (.024″) NI-780/S NI-860 NI-880/S	56 mm (2.205″)
						5.0 mm (0.197″) NI-860					
						5.23 mm (0.206″) NI-880/S					
	35.25 mm (1.388″) NI-780-4				14.2 ± 0.1 mm (.559 ± .004″) NI-780-4	5.1 mm (.201″) NI-780-4		2.0 ± 0.1 mm (.079 ± .004″) NI-780-4		0.4 mm (.016″) NI-780-4	
	41.6 mm (1.64″) NI-1230/S NI-1230-8L				26.2 ± 0.15 mm (1.031 ± .006″) NI-1230/S NI-1230-8L NI-1230S-8L	5.2 mm (0.205″) NI-1230/S		2.0 ± 0.15 mm (.079 ± .006″) NI-1230/S		0.6 mm (.024″) NI-1230/S	
						6.5 mm (0.256″) NI-1230-8L		2.0 ± 0.1 mm (.079 ± .004″) NI-1230-8L NI-1230S-8L		0.4 mm (.016″) NI-1230-8L NI-1230S-8L	
	39.9 mm (1.57″) NI-1230S-8L					6.15 mm (0.242″) NI-1230S-8L					

Metric dimensions govern — English are in parentheses for reference only.

NOTE 1: A_0, B_0, and K_0 are determined by component size. The clearance between the components and the cavity must be within .05 mm min. to .50 mm max., the component cannot rotate more than 10° within the determined cavity.

NOTE 2: Pitch information is contained in the Embossed Tape and Reel Ordering Information on pg. 32.

EMBOSSED TAPE AND REEL DATA FOR DISCRETES



Size	A Max	G	T Max
12 mm	330 mm (12.992″)	12.4 mm + 2.0 mm, – 0.0 (.49″ + .079″, – 0.00)	18.4 mm (.72″)
12 mm DFN 2x2 QFN 3x3 QFN 4x4	178 mm (7″)	12.4 mm + 2.0 mm, – 0.0 (.49″ + .079″, – 0.00)	18.4 mm (.72″)
12 mm SOT–89	178 mm (7″)	13.5 mm (.53″)	16.5 mm (.65″)
16 mm	330 mm (12.992″)	16.4 mm + 2.0 mm, – 0.0 (.646″ + .078″, – 0.00)	22.4 mm (.882″)
16 mm PQFN 5x5 PQFN 8x8	360 mm (14.173″)	16.4 mm + 2.0 mm, – 0.0 (.646″ + .078″, – 0.00)	22.4 mm (.882″)
24 mm	330 mm (12.992″)	24.4 mm + 2.0 mm, – 0.0 (.961″ + .070″, – 0.00)	30.4 mm (1.197″)
32 mm	330 mm (12.992″)	32.4 mm + 2.0 mm, – 0.0 (1.276″+ 0.79″, – 0.00)	38.4 mm (1.512″)
44 mm	330 mm (12.992″)	44.4 mm + 2.0 mm, – 0.0 (1.748″+ 0.79″, – 0.00)	50.4 mm (1.984″)
44 mm TO–270 WB–4, WBL–4, WB–14, WB–14 Gull, WB–16, WB–16 Gull, WBL–16, TO–272 WB–4, WB–14, WB–16, WB–16 Gull		45.3 mm + 0.5 mm, – 0.0 (1.785″+ 0.02″, – 0.00)	
56 mm	330 mm (12.992″)	56.3 mm + 2.0 mm, – 0.0 (2.217″+ 0.79″, – 0.00)	62.4 mm (2.46″)

Reel Dimensions

Metric Dimensions Govern — English are in parentheses for reference only

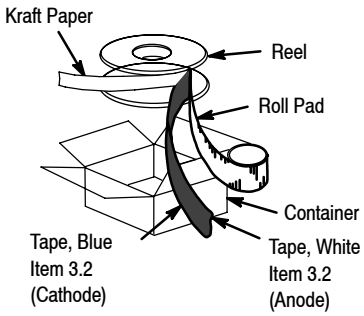


Figure 1. Reel Packing

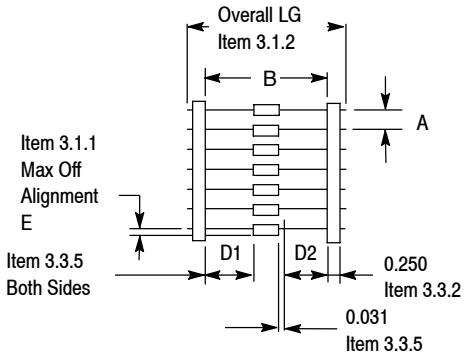


Figure 2. Component Spacing

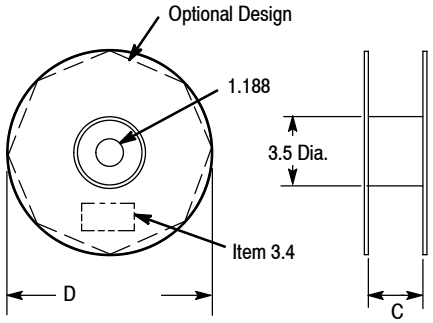


Figure 3. Reel Dimensions

Applications and Product Literature

Application Notes of special interest to designers of RF equipment are listed below. This technical documentation is available on the Freescale Semiconductor web site or is available through the Freescale Semiconductor Literature Distribution Center. Phone and fax numbers for ordering literature are listed on the back cover of this book and in the Access Data On-line section.

Application Notes

AN211A Field Effect Transistors in Theory and Practice
AN419 UHF Amplifier Design Using Data Sheet Design Curves
AN423 Field Effect Transistor RF Amplifier Design Techniques
AN548A Microstrip Design Techniques for UHF Amplifiers
AN721 Impedance Matching Networks Applied to RF Power Transistors
AN923 800 MHz Test Fixture Design
AN1032 How Load VSWR Affects Non-Linear Circuits
AN1033 Match Impedances in Microwave Amplifiers
AN1034 Three Balun Designs for Push-Pull Amplifiers
AN1526 RF Power Device Impedances: Practical Considerations
AN1530 Advanced Amplifier Concept Package
AN1617 Mounting Recommendations for Copper Tungsten Flanged Transistors
AN1643 RF LDMOS Power Modules for GSM Base Station Application: Optimum Biasing Circuit
AN1670 60 Watts, GSM 900 MHz, LDMOS Two-Stage Amplifier
AN1696 Broadband Intermodulation Performance Development Using the Rohde & Schwarz Vector Network Analyzer ZVR
AN1907 Solder Reflow Attach Method for High Power RF Devices in Over-Molded Plastic Packages
AN1908 Solder Reflow Attach Method for High Power RF Devices in Air Cavity Packages
AN1923 Mounting Method with Mechanical Fasteners for the MRF19090 and Similar Packages
AN1938 Sensitivity of High Power RF Transistors to Source and Output Loads
AN1949 Mounting Method for the MHVIC910HR2 (PFP-16) and Similar Surface Mount Packages
AN1955 Thermal Measurement Methodology of RF Power Amplifiers
AN1977 Quiescent Current Thermal Tracking Circuit in the RF Integrated Circuit Family
AN1987 Quiescent Current Control for the RF Integrated Circuit Device Family
AN3100 General Purpose Amplifier and MMIC Biasing
AN3263 Bolt Down Mounting Method for High Power RF Transistors and RFICs in Over-Molded Plastic Packages
AN3778 PCB Layout Guidelines for PQFN/QFN Style Packages Requiring Thermal Vias for Heat Dissipation
AN3789 Clamping of High Power RF Transistors and RFICs in Over-Molded Plastic Packages
AN4005 Thermal Management and Mounting Method for the PLD 1.5 RF Power Surface Mount Package

Product Literature

BR1593 RF Industrial Solutions
BR1607 RF Broadcast Solutions
BR1608 RF Commercial Aerospace Solutions
BR1609 GaAs Solutions Brochure
MMICGPAQRG RF MMIC and GPA Cross Reference
SG46 RF Product Selector Guide
50VRFLDMOSWP 50V RF LDMOS White Paper

SELECTOR GUIDE PRODUCT INDEX

Selector Guide Product Index (continued)

Selector Guide Product Index (continued)

Selector Guide Product Index (continued)

END OF LIFE RF PRODUCT INDEX

Freescale Semiconductor follows the industry standard "EIA-724 Product Life Cycle Data Model" to track the life cycle of its product. This model tracks the product's life cycle from "Product Newly Introduced" to "Product Phase Out." Products can be phased for a variety of reasons: improved product performance, change in technology roadmap, process obsolescence, market decline, etc. When products are discontinued, a suggested possible replacement device or an alternative source of supply for discontinued devices are made available when possible.

For a list of discontinued devices with possible alternative suppliers, please contact your local Freescale sales office or authorized distributor.

Product	Possible Replacement
Not Recommended for New Design	
MHV5IC2215NR2	MW6IC2015NBR1
MHV5IC1810NR2	MW6IC2015NBR1
MHVIC915NR2	MW7IC915NT1
MMG3001NT1	MMG3012NT1
MMG3002NT1	MMG3H21NT1
MMG3003NT1	MMG3014NT1
MRF282ZR1	MRF6S20010GNR1 MW6S004NT1
MRF5S19060NR1	MRF7S19080HR3 MRF7S19100NBR1
MRF5S9070NR1	MRFE6S9060NR1 MRFE6S9125NR1 MD8IC970NR1 MRF8S9102NR3
MRF6S19100NR1	MRF7S19100NR1 MRF7S19100NBR1
MRF9030LR1	MRFE6S9045NR1 MRF8P9040NR1 MRFE6S9046NR1
MRF9030NR1	MRFE6S9045NR1 MRF8P9040NR1 MRFE6S9046NR1
MRF9045NR1	MRFE6S9045NR1 MRFE6S9060NR1
MRF9060LR1	MRFE6S9045NR1 MRFE6S9060NR1
MRF9060NR1	MRFE6S9060NR1
MRFE6S9045GNR1	MRFE6S9045NR1 MRFE6S9046GNR1 MRFE6S8046GNR1 MRF8P9040GNR1
MWIC930NR1	MW7IC930NR1
MW4IC2020NBR1	MW6IC2015NBR1 MD7IC2050NBR1
MW4IC915NBR1	MW7IC915NT1 MW7IC930NBR1
MW5IC2030NBR1	MW7IC2040NBR1
MW5IC970NBR1	MW6IC9080NR1

END OF LIFE PRODUCT INDEX — continued

Product	Last Order Date	Last Ship Date	Possible Replacement
End of Life			
MD7P19130HR3	27-Jun-12	27-Jun-13	MRF8S19140HR3
MHVIC2114NR2	1-Jul-11	30-Jun-12	MW6IC2015NBR1
MHVIC910HNR2	1-Jul-11	30-Jun-12	MW6IC2015NBR1
MMG3013NT1	1-Jul-11	30-Jun-12	MMG3015NT1
MRF18085ALSR3	1-Jul-11	30-Jun-12	MRF6S18060NR1 MRF8S18120HSR1
MRF21010LSR1	1-Jul-11	30-Jun-12	MRF6S20010NR1
MRF21030LR3	27-Jun-12	27-Jun-13	MRF5P21045NR1 MRF6S21050LR3 MD7IC2050NBR1 MW7IC2040NBR1 MW6IC2240NBR1
MRF21045LR3	1-Jul-11	30-Jun-12	MRF6S21050LR3 MRF5P21045NR1
MRF21045LSR3	1-Jul-11	30-Jun-12	MRF6S21050LSR3 MRF5P21045NR1
MRF373ALR1	1-Jul-11	30-Jun-12	MRFE6S9060NR1
MRF377HR3	1-Jul-11	30-Jun-12	MRFE6P3300HR3 MRF6VP3450HR6
MRF5P21180HR6	27-Jun-12	27-Jun-13	MRF8S21200HR6
MRF5S19060NBR1	1-Jul-11	30-Jun-12	MRF7S19080HR3
MRF5S19130HSR3	1-Jul-11	30-Jun-12	MRF7S19120NR1 MD7P19130HSR3 MRF6S19140HSR3 MRF7S19170HSR3
MRF5S19150HR3	1-Jul-11	30-Jun-12	MRF8S19140HR3
MRF5S21045NBR1	1-Jul-11	30-Jun-12	MRF5P21045NR1 MRF6S21050LR3
MRF5S21045NR1	1-Jul-11	30-Jun-12	MRF5P21045NR1 MRF6S21050LR3
MRF5S4125NBR1	1-Jul-11	30-Jun-12	MRF6V3090NBR1 MRF6V2300NBR1
MRF5S4125NR1	1-Jul-11	30-Jun-12	MRF6V3090NR1 MRF6V2300NR1
MRF5S9080NR1	27-Jun-12	27-Jun-13	MRF8S9102NR3
MRF5S9100NR1	27-Jun-12	27-Jun-13	MRF8S9100HSR3 MRF8S9102NR3 MRFE6S9125NR1
MRF5S9100NBR1	1-Jul-11	30-Jun-12	MRF8S9102NR3 MRF8S9100HR3 MRF5S9080NBR1
MRF5S9101NR1	1-Jul-11	30-Jun-12	MRF5S9102NR3 MRF8S9100HR3 MRFE6S9125NR1
MRF5S9101NBR1	27-Jun-12	27-Jun-13	MRF8S9102NR3 MRFE6S9125NBR1 MRF8S9102NR3

END OF LIFE PRODUCT INDEX — continued

Product	Last Order Date	Last Ship Date	Possible Replacement
End of Life — continued			
MRF5S9150HSR3	1-Jul-11	30-Jun-12	MRFE6S9135HSR3 MRFE6S9160HSR3 MRFE6S9125NR1 MRF8S9170NR3
MRF6P18190HR6	1-Jul-11	30-Jun-12	MRF8P18265HR6
MRF6P21190HR6	1-Jul-11	30-Jun-12	MRF8P18265HR6 MRF6S21190HSR3 MRF8S21200HR6
MRF6P23190HR6	27-Jun-12	27-Jun-13	MRF8P20160HR3
MRF6S18060NBR1	1-Jul-11	30-Jun-12	MRF6S18060NR1 MRF8S18120HR3
MRF6S18100NBR1	1-Jul-11	30-Jun-12	MRF8S18120HR3
MRF6S18100NR1	1-Jul-11	30-Jun-12	MRF8S18120HSR3
MRF6S19060NBR1	1-Jul-11	30-Jun-12	MRF7S19080HR3
MRF6S19060NR1	27-Jun-12	27-Jun-13	MRF7S19080HSR3
MRF6S19060GNR1	27-Jun-12	27-Jun-13	MRF7S19080HR3
MRF6S19100HSR3	1-Jul-11	30-Jun-12	MRF7S19100NR1 MRF7S19120NR1 MRF6S19140HSR3
MRF6S19100NBR1	1-Jul-11	30-Jun-12	MRF7S19100NR1 MRF7S19100NBR1
MRF6S19140HR3	1-Jul-11	30-Jun-12	MRF6S19140HSR3 MRF8S19140HR3 MRF8S19140HSR3
MRF6S19200HSR3	1-Jul-11	30-Jun-12	MRF8S19260HSR6 MRF8S19140HSR3
MRF6S21060NBR1	1-Jul-11	30-Jun-12	MRF5P21045NR1 MRF6S21100HR3
MRF6S21060NR1	1-Jul-11	30-Jun-12	MRF5P21045NR1 MRF6S21100HR3 MRF8S21100HSR3
MRF6S21100HSR3	1-Jul-11	30-Jun-12	MRF6S21100HR3 MRF7S21110HSR3 MRF8S21100HSR3
MRF6S21100NBR1	1-Jul-11	30-Jun-12	MRF7S21110HR3 MRF8S21120HR3 MRF8S21100HR3
MRF6S21100NR1	1-Jul-11	30-Jun-12	MRF7S21110HSR3 MRF8S21120HSR3 MRF8S21100HSR3
MRF6S21140HSR3	27-Jun-12	27-Jun-13	MRF7S21150HSR3 MRF8S21140HSR3
MRF6S21190HR3	1-Jul-11	30-Jun-12	MRF6S21190HSR3 MRF8S21200HR6
MRF6S23100HR3	27-Jun-12	27-Jun-13	MRF8S26120HR3
MRF6S23100HSR3	27-Jun-12	27-Jun-13	MRF8S26120HSR3

END OF LIFE PRODUCT INDEX — continued

Product	Last Order Date	Last Ship Date	Possible Replacement
End of Life — continued			
MRF6S23140HR3	27-Jun-12	27-Jun-13	MRF8S26120HR3
MRF6S23140HSR3	27-Jun-12	27-Jun-13	MRF8S26120HSR3
MRF6S27050HR3	27-Jun-12	27-Jun-13	MRF8P26080HR3
MRF6S27050HSR3	27-Jun-12	27-Jun-13	MRF8P26080HSR3
MRF6V10250HSR3	1-Jul-11	30-Jun-12	MRF6V12250HSR3 MRF6V14300HSR3
MRF7S16150HR3	27-Jun-12	27-Jun-13	MRF7S15100HR3
MRF7S18125AHR3	27-Jun-12	27-Jun-13	MRF8S18260HR6
MRF7S18125AHSR3	27-Jun-12	27-Jun-13	MRF8S18260HR6
MRF7S18125BHR3	27-Jun-12	27-Jun-13	MRF8S18260HR6
MRF7S18125BHSR3	27-Jun-12	27-Jun-13	MRF8S18260HR6
MRF7S18170HR3	27-Jun-12	27-Jun-13	MRF8S18260HR6
MRF7S19170HR3	27-Jun-12	27-Jun-13	MRF8S19260HR6
MRF7S21080HR3	27-Jun-12	27-Jun-13	MRF8HP21080HR3 MRF7S21110HR3 MRF6S21100HR3
MRF7S21150HR3	27-Jun-12	27-Jun-13	MRF8S21140HR3 MRF8S21172HR3 MRF7S21170HR3
MRF7S21210HR3	27-Jun-12	27-Jun-13	MRF8S21172HR3
MRF7S21210HSR3	27-Jun-12	27-Jun-13	MRF8S21172HSR3
MRF7S38040HSR3	27-Jun-12	27-Jun-13	MW7IC3825NR1 MRF7S38075HSR3
MRF9030GNR1	1-Jul-11	30-Jun-12	MW7IC930GNR1 MRFE6S9045NR1 MRFE6S9046GNR1 MRFE6S8046GNR1 MRF8P9040GNR1
MRF9045GNR1	1-Jul-11	30-Jun-12	MRFE6S9045NR1 MRFE6S9046GNR1 MRFE6S8046GNR1 MRF8P9040GNR1
MRF9045LR1	1-Jul-11	30-Jun-12	MRFE6S9045NR1 MRFE6S9046NR1 MRFE6S8046NR1 MRF8P9040NBR1
MRF9045LSR1	1-Jul-11	30-Jun-12	MRFE6S9045NR1 MRFE6S9046NR1 MRFE6S8046NR1 MRF8P9040NR1
MRF9135LSR3	1-Jul-11	30-Jun-12	MRFE6S9135HSR3 MRF8S9100HSR3
MRFE6S9130HR3	27-Jun-12	27-Jun-13	MRF8S9200NR3 MRFE6S9160HSR3 MRF8S9100HR3 MRF8S9220HR3
MRFE6S9130HSR3	1-Jul-11	30-Jun-12	MRFE6S9135HSR3 MRF8S9100HSR3

END OF LIFE PRODUCT INDEX — continued

Product	Last Order Date	Last Ship Date	Possible Replacement
End of Life — continued			
MRFE6S9135HR3	1-Jul-11	30-Jun-12	MRFE6S9135HSR3 MRF8S9170NR3
MRFE6S9160HR3	1-Jul-11	30-Jun-12	MRFE6S9160HSR3 MRF8S9170NR3
MRFE6S9200HR3	27-Jun-12	27-Jun-13	MRF8S9200NR3 MRF8S9202NR3
MRFE6S9200HSR3	1-Jul-11	30-Jun-12	MRF8S9260HSR3 MRF8S9200NR3 MRF8S9202NR3
MRFE6S9205HR3	1-Jul-11	30-Jun-12	MRFE6S9205HSR3 MRF8S9260HR3 MRF8S9200NR3 MRF8S9202NR3
MRFG35002N6AT1	1-Jul-11	30-Jun-12	MRFG35003ANT1
MRFG35020AR1	1-Jul-11	30-Jun-12	MRFG35010AR1 MRFG35010ANT1
MW4IC2020GNBR1	1-Jul-11	30-Jun-12	MW7IC2220GNR1 MW7IC2040GNR1
MW4IC2230NBR1	1-Jul-11	30-Jun-12	MD7IC2050NBR1 MW7IC2040NBR1
MW4IC915GNBR1	27-Jun-12	27-Jun-13	MW7IC915NT1 MW7IC930GNR1
MW5IC2030GNBR1	1-Jul-11	30-Jun-12	MD7IC2050NBR1 MW7IC2220GNR1
MW5IC970GNBR1	1-Jul-11	30-Jun-12	MWE6IC9080GNR1
MW6IC2015GNBR1	1-Jul-11	30-Jun-12	MW6IC2015NBR1
MW6IC2240GNBR1	1-Jul-11	30-Jun-12	MW7IC2240GNR1 MW7IC2220GNR1 MW7IC2040GNR1
MW6IC2240NBR1	27-Jun-12	27-Jun-13	MW7IC2240NBR1
MW6IC2420NBR1	1-Jul-11	30-Jun-12	MW6IC2240NBR1 MW7IC2220NBR1
MWE6IC9100NR1	1-Jul-11	30-Jun-12	MWE6IC9100NBR1 MWE6IC9080NR1
MWIC930GNR1	1-Jul-11	30-Jun-12	MW7IC930NR1 MW7IC930GNR1

How to Reach Us:

Home Page:
www.freescale.com

Web Support:
www.freescale.com/support

USA/Europe or Locations Not Listed:
Freescale Semiconductor, Inc.
Technical Information Center, EL516
2100 E. Elliot Road
Tempe, Arizona 85284
1-800-521-6274 or +1-480-768-2130
www.freescale.com/support

Europe, Middle East, and Africa:
Freescale Halbleiter Deutschland GmbH
Technical Information Center
Schatzbogen 7
81829 Muenchen, Germany
+44 1296 380 456 (English)
+46 8 52200080 (English)
+49 89 92103 559 (German)
+33 1 69 35 48 48 (French)
support@freescale.com

Japan:
Freescale Semiconductor Japan Ltd.
Headquarters
ARCO Tower 15F
1-8-1, Shimo-Meguro, Meguro-ku,
Tokyo 153-0064,
Japan
0120 191014
+81 3 5437 9125
support.japan@freescale.com

Asia/Pacific:
Freescale Semiconductor China Ltd.
Exchange Building 23F
No. 118 Jianguo Road
Chaoyang District
Beijing 100022
China
+86 10 5879 8000
support.asia@freescale.com

For Literature Requests Only:
Freescale Semiconductor Literature Distribution Center
1-800-441-2447 or +1-303-675-2140
Fax: +1-303-675-2150
LDCForFreescaleSemiconductor@hibbertgroup.com

SG46
Rev. 37
10/2011

freescale™