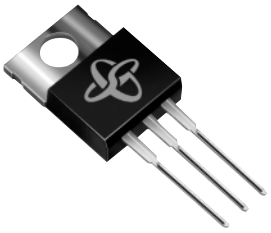
GENERAL SEMICONDUCTOR®

IRFZ44N

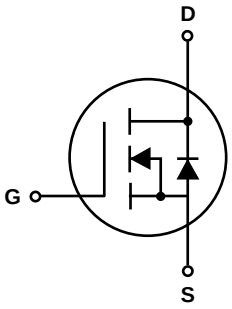
N-Channel Enhancement-Mode MOSFET

V_{DS} 55V **$R_{DS(ON)}$** 20mΩ **I_D** 49A

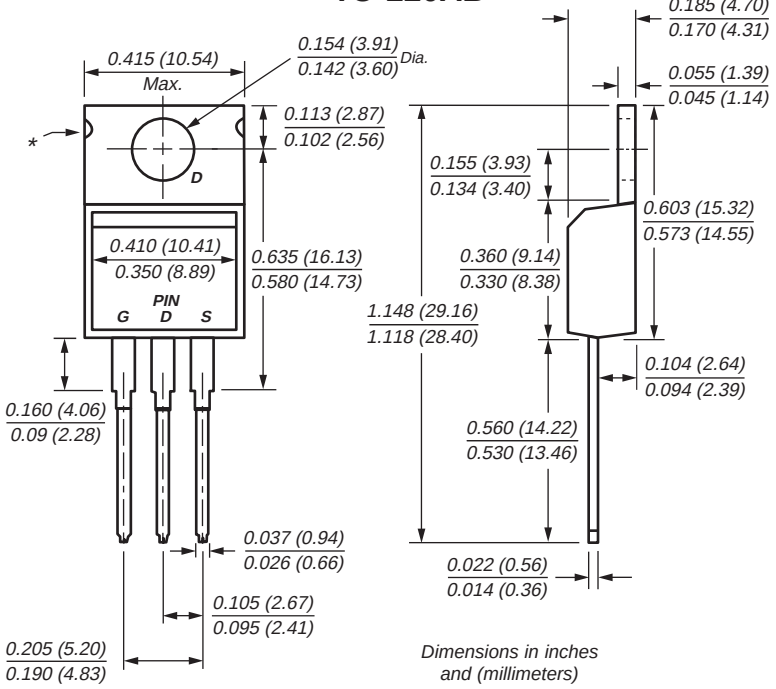


TRENCH GENFET®

New Product



TO-220AB



Dimensions in inches and (millimeters)

* May be notched or flat

Features

- Dynamic dv/dt Rating
- Repetitive Avalanche Rated
- 175°C Operating Temperature
- Ease of Paralleling
- Fast Switching for High Efficiency
- Simple Drive Requirements

Mechanical Data

Case: JEDEC TO-220AB molded plastic body

Terminals: Leads solderable per MIL-STD-750, Method 2026

High temperature soldering guaranteed: 250°C/10 seconds, 0.17" (4.3mm) from case

Mounting Torque: 10 in-lbs maximum

Weight: 2.0g

Maximum Ratings and Thermal Characteristics (T_C = 25°C unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	55	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current V_{GS} =10V	T_C = 25°C T_C = 100°C	I_D	49 35	A
Pulsed Drain Current(1)		I_{DM}	160	A
Maximum Power Dissipation	T_C = 25°C	P_D	94	W
Single Pulse Avalanche Energy(2)		E_{AS}	210	mJ
Avalanche Current(1)		I_{AR}	25	A
Repetitive Avalanche Energy(1)		E_{AR}	11	mJ
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 175	°C
Junction-to-Case Thermal Resistance		$R_{\theta JC}$	1.6	°C/W
Junction-to-Ambient Thermal Resistance		$R_{\theta JA}$	62	°C/W

Notes: (1) Repetitive rating; pulse width limited by max. junction temperature
(2) V_{DD} = 25V, starting T_J = 25°C, L = 470µH, R_G = 25Ω, I_{AS} = 25A

5/8/01

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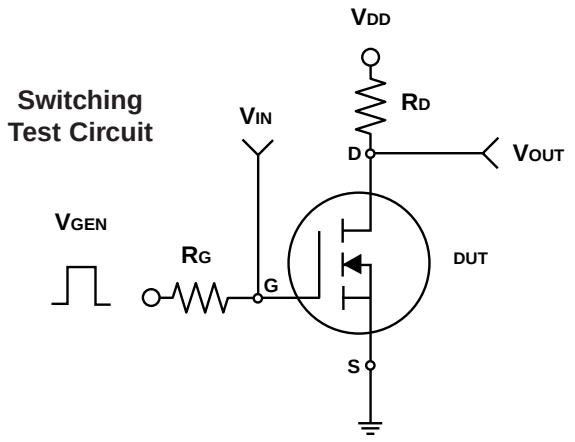
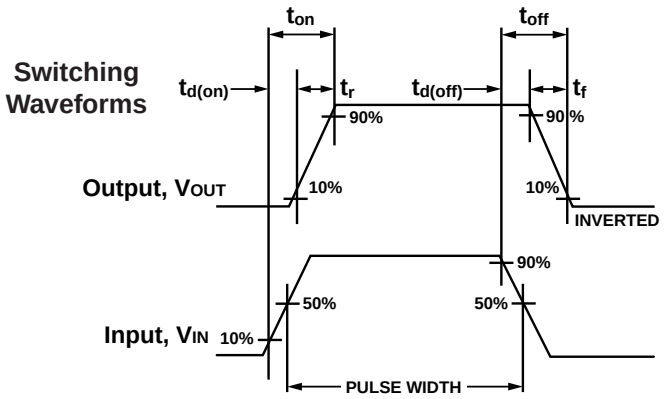
Electrical Characteristics (T_J = 25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250µA	55	–	–	V
Drain-Source On-State Resistance[1]	$R_{DS(on)}$	V_{GS} = 10V, I_D = 25A	–	16	20	mΩ
		V_{GS} = 6V, I_D = 23A	–	18	22	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250µA	2.0	–	4.0	V
Forward Transconductance[1]	g_{fs}	V_{DS} = 25V, I_D = 25A	17	78	–	S
Drain-Source Leakage Current	I_{DSS}	V_{DS} = 55V, V_{GS} = 0V	–	–	25	µA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V	–	–	±100	nA
Dynamic						
Total Gate Charge[1]	Q_g	V_{DS} = 44V, I_D = 25A, V_{GS} = 5V	–	29	40	nC
		V_{DS} = 44V, V_{GS} = 10V, I_D = 25A	–	60	65	
Gate-Source Charge[1]	Q_{gs}		–	11	—	
Gate-Drain ("Miller") Charge[1]	Q_{gd}		–	13	—	
Turn-On Delay Time[1]	$t_{d(on)}$	V_{DD} = 28V, I_D = 25A, R_G = 12Ω, R_D = 1.1Ω, V_{GEN} = 10V	–	19	34	ns
Rise Time[1]	t_r		–	185	240	
Turn-Off Delay Time[1]	$t_{d(off)}$		–	85	119	
Fall Time[1]	t_f		–	165	210	
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1.0MHz	–	3223	–	pF
Output Capacitance	C_{oss}		–	308	–	
Reverse Transfer Capacitance	C_{rss}		–	135	–	
Source-Drain Diode						
Continuous Source Current	I_S	–	–	–	49	A
Pulsed Source Current[2]	I_{SM}	–	–	–	160	
Diode Forward Voltage[1]	V_{SD}	I_S = 25A, V_{GS} = 0V	–	0.93	1.3	V
Source-Drain Reverse Recovery Time[1]	t_{rr}	I_F = 25A, di/dt = 100A/µs	–	53	–	ns
Source-Drain Reverse Recovery Charge[1]	Q_{rr}		–	93	–	nC

Notes: (1) Pulse width ≤ 300µs; duty cycle ≤ 2%
(2) Repetitive rating; pulse width limited by max. junction temperature





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Ratings and Characteristic Curves

Fig. 1 - Output Characteristics

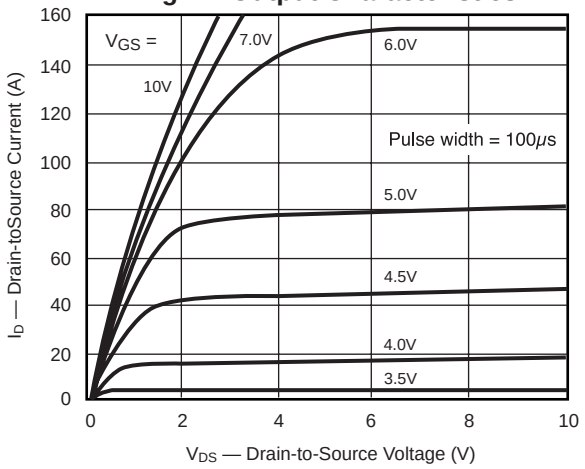

Fig. 2 - Transfer Characteristics

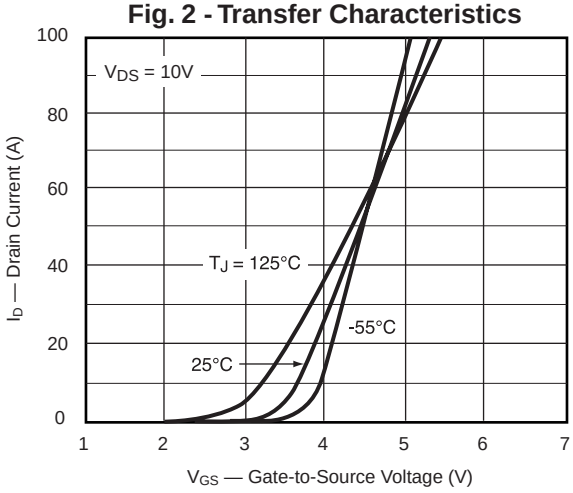

Fig. 3 - On Resistance vs. Drain Current

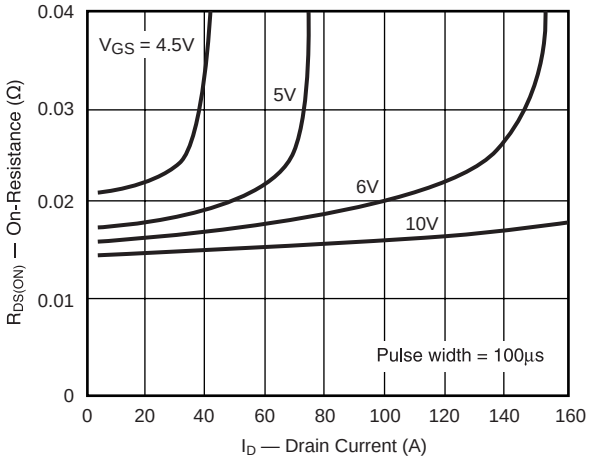

Fig. 4 - Capacitance

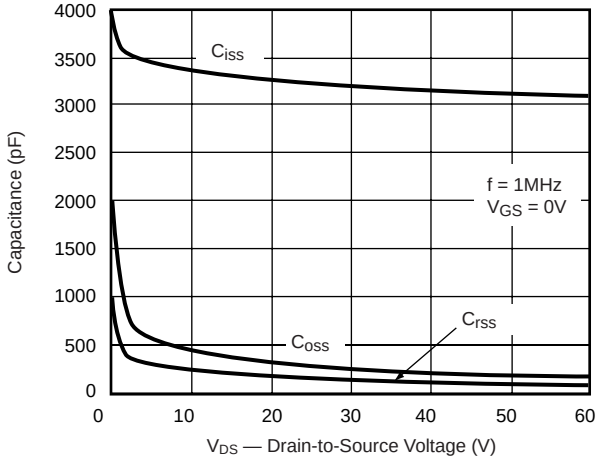

Fig. 5 - Gate Charge

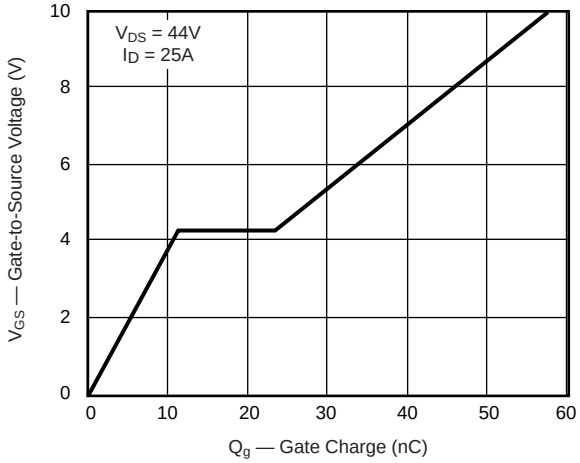

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Fig. 6 - Source-Drain Diode Forward Voltage

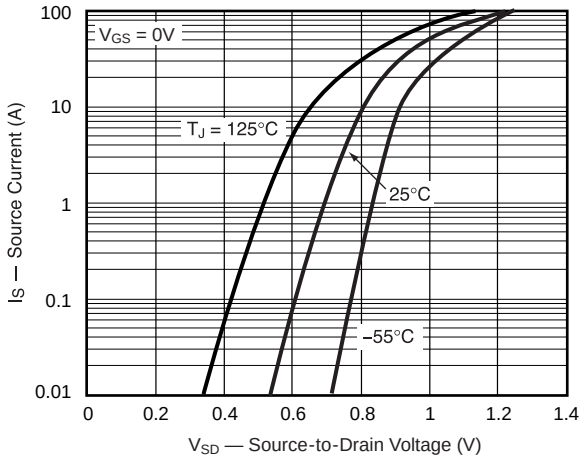


Fig. 7 – On-Resistance vs. Gate-to-Source Voltage

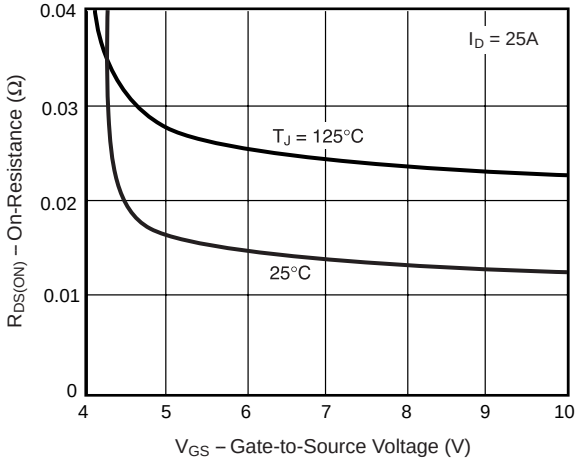


Fig. 8 – Breakdown Voltage vs. Junction Temperature

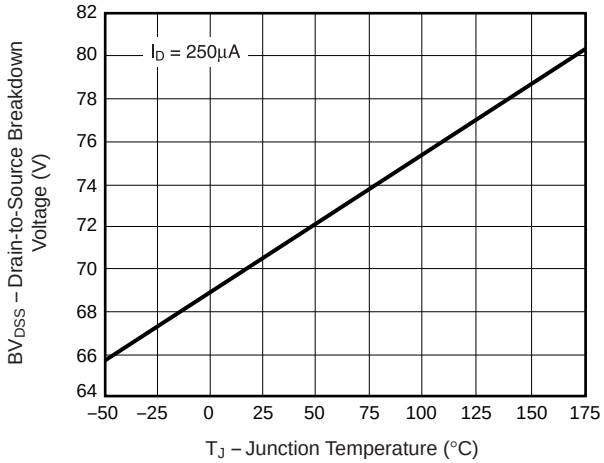
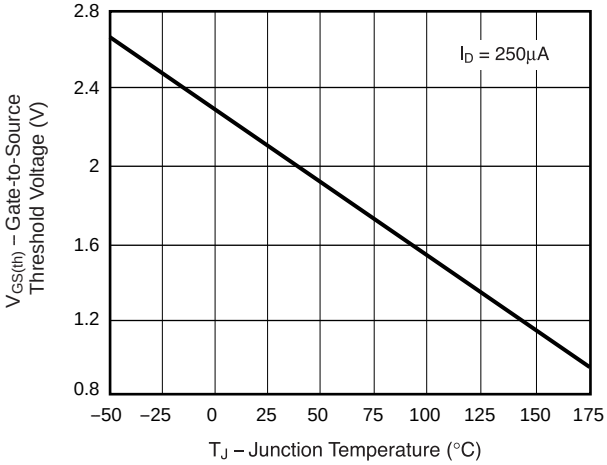


Fig. 9 – Threshold Voltage



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Ratings and Characteristic Curves

Fig. 10 – On-Resistance vs. Junction Temperature

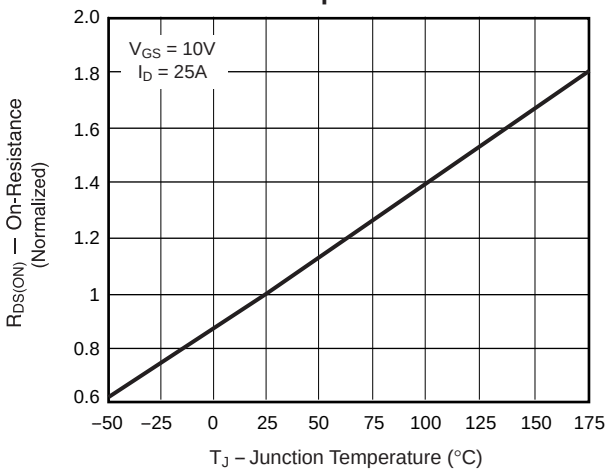

Fig. 11 – Thermal Impedance

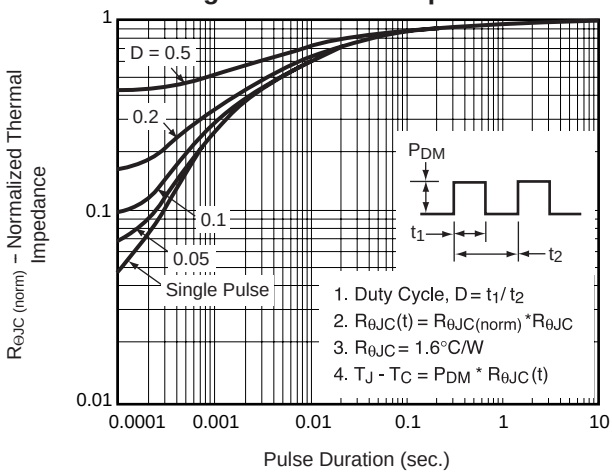

Fig. 12 – Power vs. Pulse Duration

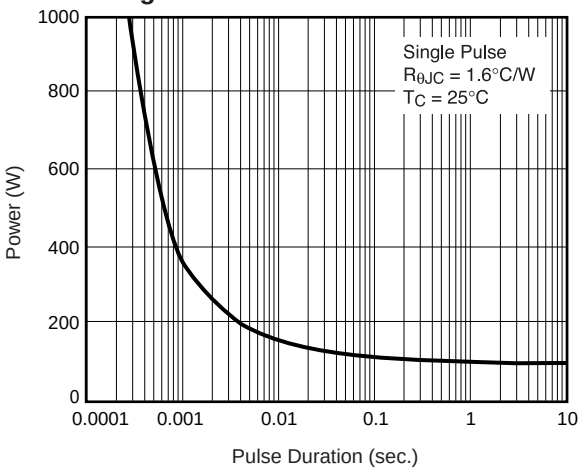
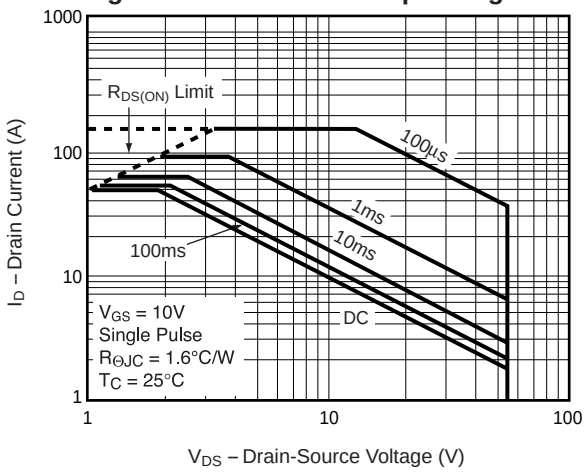
Fig. 13 – Maximum Safe Operating Area