

## Sample Datasheet

### A. ECAD Design Information

This appendix contains information that supports the development of the PCB ECAD model for this device. It is intended to be used by PCB designers.

#### A.1 Part Number Indexing

Orderable Part Number	Number of Pins	Package Type	Package Code/POD Number
R5F21546EJFP	48	LFQFP	PLQP0048KB-A
R5F21546EKFP	48	LFQFP	PLQP0048KB-A
R5F21546FJFP	48	LFQFP	PLQP0048KB-A
R5F21546FKFP	48	LFQFP	PLQP0048KB-A
R5F21546GJFP	48	LFQFP	PLQP0048KB-A
R5F21546GKFP	48	LFQFP	PLQP0048KB-A
R5F21546HJFP	48	LFQFP	PLQP0048KB-A
R5F21546HKFP	48	LFQFP	PLQP0048KB-A
R5F21547EJFP	48	LFQFP	PLQP0048KB-A
R5F21547EKFP	48	LFQFP	PLQP0048KB-A
R5F21547FJFP	48	LFQFP	PLQP0048KB-A
R5F21547FKFP	48	LFQFP	PLQP0048KB-A
R5F21547GJFP	48	LFQFP	PLQP0048KB-A
R5F21547GKFP	48	LFQFP	PLQP0048KB-A
R5F21547HJFP	48	LFQFP	PLQP0048KB-A
R5F21547HKFP	48	LFQFP	PLQP0048KB-A
R5F21548EJFP	48	LFQFP	PLQP0048KB-A
R5F21548EKFP	48	LFQFP	PLQP0048KB-A
R5F21548FJFP	48	LFQFP	PLQP0048KB-A
R5F21548FKFP	48	LFQFP	PLQP0048KB-A
R5F21548GJFP	48	LFQFP	PLQP0048KB-A
R5F21548GKFP	48	LFQFP	PLQP0048KB-A
R5F21548HJFP	48	LFQFP	PLQP0048KB-A
R5F21548HKFP	48	LFQFP	PLQP0048KB-A
R5F2154AEJFP	48	LFQFP	PLQP0048KB-A
R5F2154AEKFP	48	LFQFP	PLQP0048KB-A
R5F2154AFJFP	48	LFQFP	PLQP0048KB-A
R5F2154AFKFP	48	LFQFP	PLQP0048KB-A
R5F2154AGJFP	48	LFQFP	PLQP0048KB-A
R5F2154AGKFP	48	LFQFP	PLQP0048KB-A
R5F2154AHJFP	48	LFQFP	PLQP0048KB-A
R5F2154AHKFP	48	LFQFP	PLQP0048KB-A
R5F2154CFJFP	48	LFQFP	PLQP0048KB-A
R5F2154CFKFP	48	LFQFP	PLQP0048KB-A
R5F2154CGJFP	48	LFQFP	PLQP0048KB-A
R5F2154CGKFP	48	LFQFP	PLQP0048KB-A
R5F2154CHJFP	48	LFQFP	PLQP0048KB-A
R5F2154CHKFP	48	LFQFP	PLQP0048KB-A

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### A.2 Symbol Pin Information

#### A.2.1 48-LFQFP

Pin Number	Primary Pin Name	Primary Electrical Type	Alternate Pin Name(s)
1	P3_5	I/O	SCL_0/SSCK_0/TRCIOD_0/CLK2/TRDIOD1_0/TRDIOA0_0/TRDCLK_0
2	P3_3	I/O	SSI_0/INT3#/TRCCLK_0/SCS_0#/CTS2#/RTS2#/TRDIOD0_0
3	P3_4	I/O	SDA_0/SCS_0/TRCIOCI_0/SSI_0/RXD2/TXD2/TRDIOC1_0/TRDIOB0_0
4	MODE	Input	-
5	P4_3	I/O	-
6	P4_4	I/O	-
7	\RESET	Input	-
8	XOUT	I/O	P4_7
9	VSS	Power	AVSS
10	XIN	Input	P4_6
11	VCC	Power	AVCC
12	P2_7	I/O	TRDIOD1_0
13	P2_6	I/O	TRDIOC1_0
14	P2_5	I/O	TRDIOB1_0/IVREF3
15	P2_4	I/O	TRDIOA1_0/IVCMP3
16	P2_3	I/O	TRDIOD0_0
17	P2_2	I/O	TRDIOC0_0/TRDIOB0_0/TRCIOD_0
18	P2_1	I/O	TRDIOB0_0/TRDIOC0_0/TRCIOCI_0
19	P2_0	I/O	TRDIOA0_0/TRDCLK_0/TXD2/INT1#/RXD2/TRCIOB_0
20	P1_7	I/O	INT1#/TRJIO_0
21	P1_6	I/O	CLK_0/SSI_0
22	P1_5	I/O	RXD_0/TRJIO_0/INT1#
23	P1_4	I/O	TXD_0/TRCCLK_0
24	P1_3	I/O	KI3#/AN11/TRBO_0/TRCIOCI_0/TRDIOD1_0
25	P4_5	I/O	INT0#/RXD2
26	P6_6	I/O	INT2#/TXD2/TRCIOCI_0
27	P6_7	I/O	INT3#/RXD2/TRCIOD_0
28	P1_2	I/O	KI2#/AN10/TRCIOB_0/TRDIOC1_0
29	P1_1	I/O	KI1#/AN9/TRCIOA_0/TRCTRG_0/TRDIOB1_0/IVCMP1
30	P1_0	I/O	KI0#/AN8/TRCIOD_0/TRDIOA1_0/IVREF1
31	P3_1	I/O	TRBO_0/CTS2#/RTS2#
32	P3_0	I/O	TRJO_0
33	P6_5	I/O	INT4#/CLK2/CLK_1/TRCIOB_0
34	P6_4	I/O	RXD_1/INT2#/TRJIO_1
35	P6_3	I/O	TXD_1/TRJO_1
36	P0_7	I/O	AN0/TRCIOCI_0
37	P0_6	I/O	AN1/TRCIOD_0
38	P0_5	I/O	AN2/CLK2/TRCIOB_0
39	P0_4	I/O	AN3/TMRE20/TRCIOB_0
40	P4_2	Input	VREF
41	P6_0	I/O	TMRE20
42	P6_2	I/O	CLK_1
43	P6_1	I/O	-
44	P0_3	I/O	AN4/CLK_1/TRCIOB_0
45	P0_2	I/O	AN5/RXD_1/TRCIOA_0/TRCTRG_0/TRJIO_1/INT2#
46	P0_1	I/O	AN6/TXD_1/TRCIOA_0/TRCTRG_0/TRJO_1
47	P0_0	I/O	AN7/TXD2/TRCIOA_0/TRCTRG_0
48	P3_7	I/O	SSO_0/TXD2/RXD2/TRJO_0/SDA_0/INT3/TRCCLK_0/TRDIOC0_0

## Sample Datasheet

### A.3 Symbol Parameters

Part Number	Input Voltage Min	Input Voltage Max	Operable Frequency Max	Operable Temperature Low	Operable Temperature High	Data Flash Memory	Flash ROM	Interface	ADC Channels	I2C Channels	SPI Channels	UART Channels	Timers/Counters
R5F21546EJFP	2.7 V	5.5 V	20 MHz	-40 °C	+85 °C	2.5 KB	32 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21546EKFP	2.7 V	5.5 V	20 MHz	-40 °C	+125 °C	2.5 KB	32 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21546FJFP	2.7 V	5.5 V	20 MHz	-40 °C	+85 °C	2.5 KB	32 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21546FKFP	2.7 V	5.5 V	20 MHz	-40 °C	+125 °C	2.5 KB	32 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21546GJFP	2.7 V	5.5 V	20 MHz	-40 °C	+85 °C	2.5 KB	32 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21546GKFP	2.7 V	5.5 V	20 MHz	-40 °C	+125 °C	2.5 KB	32 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21546HJFP	2.7 V	5.5 V	20 MHz	-40 °C	+85 °C	2.5 KB	32 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21546HKFP	2.7 V	5.5 V	20 MHz	-40 °C	+125 °C	2.5 KB	32 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21547EJFP	2.7 V	5.5 V	20 MHz	-40 °C	+85 °C	4 KB	48 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21547EKFP	2.7 V	5.5 V	20 MHz	-40 °C	+125 °C	4 KB	48 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21547FJFP	2.7 V	5.5 V	20 MHz	-40 °C	+85 °C	4 KB	48 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21547FKFP	2.7 V	5.5 V	20 MHz	-40 °C	+125 °C	4 KB	48 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21547GJFP	2.7 V	5.5 V	20 MHz	-40 °C	+85 °C	4 KB	48 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21547GKFP	2.7 V	5.5 V	20 MHz	-40 °C	+125 °C	4 KB	48 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21547HJFP	2.7 V	5.5 V	20 MHz	-40 °C	+85 °C	4 KB	48 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch

# Sample Datasheet

Part Number	Input Voltage Min	Input Voltage Max	Operable Frequency Max	Operable Temperature Low	Operable Temperature High	Data Flash Memory	Flash ROM	Interface	ADC Channels	I2C Channels	SPI Channels	UART Channels	Timers/Counters
R5F21547HKFP	2.7 V	5.5 V	20 MHz	-40 °C	+125 °C	4 KB	48 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21548EJFP	2.7 V	5.5 V	20 MHz	-40 °C	+85 °C	6KB	64 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21548EKFP	2.7 V	5.5 V	20 MHz	-40 °C	+125 °C	6KB	64 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21548FJFP	2.7 V	5.5 V	20 MHz	-40 °C	+85 °C	6KB	64 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21548FKFP	2.7 V	5.5 V	20 MHz	-40 °C	+125 °C	6KB	64 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21548GJFP	2.7 V	5.5 V	20 MHz	-40 °C	+85 °C	6KB	64 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21548GKFP	2.7 V	5.5 V	20 MHz	-40 °C	+125 °C	6KB	64 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21548HJFP	2.7 V	5.5 V	20 MHz	-40 °C	+85 °C	6KB	64 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F21548HKFP	2.7 V	5.5 V	20 MHz	-40 °C	+125 °C	6KB	64 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F2154AEJFP	2.7 V	5.5 V	20 MHz	-40 °C	+85 °C	8 KB	96 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F2154AEKFP	2.7 V	5.5 V	20 MHz	-40 °C	+125 °C	8 KB	96 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F2154AFJFP	2.7 V	5.5 V	20 MHz	-40 °C	+85 °C	8 KB	96 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F2154AFKFP	2.7 V	5.5 V	20 MHz	-40 °C	+125 °C	8 KB	96 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F2154AGJFP	2.7 V	5.5 V	20 MHz	-40 °C	+85 °C	8 KB	96 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F2154AGKFP	2.7 V	5.5 V	20 MHz	-40 °C	+125 °C	8 KB	96 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F2154AHJFP	2.7 V	5.5 V	20 MHz	-40 °C	+85 °C	8 KB	96 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F2154AHKFP	2.7 V	5.5 V	20 MHz	-40 °C	+125 °C	8 KB	96 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F2154CFJFP	2.7 V	5.5 V	20 MHz	-40 °C	+85 °C	10 KB	128 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch

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Part Number	Input Voltage Min	Input Voltage Max	Operable Frequency Max	Operable Temperature Low	Operable Temperature High	Data Flash Memory	Flash ROM	Interface	ADC Channels	I2C Channels	SPI Channels	UART Channels	Timers/Counters
R5F2154CFKFP	2.7 V	5.5 V	20 MHz	-40 °C	+125 °C	10 KB	128 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F2154CGJFP	2.7 V	5.5 V	20 MHz	-40 °C	+85 °C	10 KB	128 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F2154CGKFP	2.7 V	5.5 V	20 MHz	-40 °C	+125 °C	10 KB	128 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F2154CHJFP	2.7 V	5.5 V	20 MHz	-40 °C	+85 °C	10 KB	128 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch
R5F2154CHKFP	2.7 V	5.5 V	20 MHz	-40 °C	+125 °C	10 KB	128 KB	UART,I2C,SSU,CAN,LIN	10 bit x 12-Ch	2	0	3	8-bit X 1-Ch, 16-bit X 5-Ch

## Sample Datasheet

### A.4 Footprint Design Information

#### A.4.1 48-LFQFP

IPC Footprint Type	Package Code/ POD number	Number of Pins
QFP	PLQP0048KB-A	48

Description	Dimension	Value (mm)	Diagram
Minimum lead span (vertical side)	Dmin	8.8	
Maximum lead span (vertical side)	Dmax	9.2	
Minimum lead span (horizontal side)	Emin	8.8	
Maximum lead span (horizontal side)	Emax	9.2	
Minimum body span (vertical side)	D1min	7.1	
Maximum body span (vertical side)	D1max	7.1	
Minimum body span (horizontal side)	E1min	7.1	
Maximum body span (horizontal side)	E1max	7.1	
Minimum Lead Width	Bmin	0.17	
Maximum Lead Width	Bmax	0.27	
Minimum Lead Length	Lmin	0.35	
Maximum Lead Length	Lmax	0.65	
Maximum Height	Amax	1.7	
Minimum Standoff Height	A1min	0	
Minimum Lead Thickness	cmin	0.09	
Maximum Lead Thickness	cmax	0.2	
Number of pins (vertical side)	PinCountD	12	
Number of pins (horizontal side)	PinCountE	12	
Distance between the center of any two adjacent pins	Pitch	0.5	
Location of pin 1; S2 = corner of D side, C1 = center of E side	Pin1	S2	
Minimum thermal pad size (vertical side)	D2min	-	
Maximum thermal pad size (vertical side)	D2max	-	
Minimum thermal pad size (horizontal side)	E2min	-	
Maximum thermal pad size (horizontal side)	E2max	-	

Recommended Land Pattern (NSMD Design)			
Description	Dimension	Value (mm)	Diagram
Distance between left pad toe to right pad toe (horizontal side)	ZE	-	
Distance between top pad toe to bottom pad toe (vertical side)	ZD	-	
Distance between left pad heel to right pad heel (horizontal side)	GE	-	
Distance between top pad heel to bottom pad heel (vertical side)	GD	-	
Pad Width	X	-	
Pad Length	Y	-	