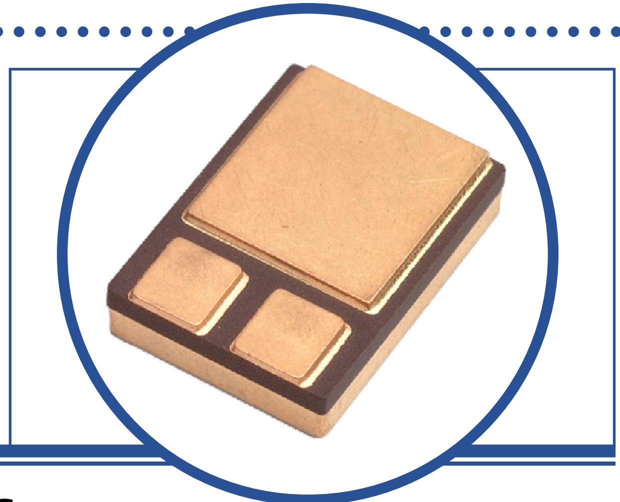
P-CHANNEL POWER MOSFET

TT electronics
Semelab Limited

IRFN5210



- Low $R_{DS(on)}$ Power MOSFET Transistor, Fully Avalanche Rated
- Hermetic Ceramic Surface Mount package
- Designed For Fast Switching Applications
- Screening Options Available

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise stated)

Symbol	Parameter	Condition	Value
V_{DS}	Drain – Source Voltage		-100V
V_{GS}	Gate – Source Voltage		±20V
I_D	Continuous Drain Current	T_C = 25°C	-34A
I_D	Continuous Drain Current	T_C = 100°C	-24A
I_{DM}	Pulsed Drain Current (1)		-120A
P_D	Total Power Dissipation at	T_C = 25°C	150W
		Derate Above 25°C	1.0W/°C
E_{AS}	Single Pulse Avalanche Energy (2)		780mJ
dv/dt	Peak Diode Recovery (3)		-5.0V/ns
T_J	Junction Temperature Range		-55 to +175°C
T_{stg}	Storage Temperature Range		-55 to +175°C

THERMAL PROPERTIES

Symbols	Parameters	Max.	Units
$R_{\theta JC}$	Thermal Resistance, Junction To Case	1.0	°C/W

Notes

(1) Repetitive Rating: Pulse width limited by maximum junction temperature
(2) @V_{DD} = -25V, L = 3.1mH, Peak I_L = -21A, Starting T_J = 25°C, R_G = 25Ω
(3) @ I_{SD} ≤ -21A, di/dt ≤ -480A/µs, V_{DD} ≤ -100V, T_J ≤ 175°C
(4) Pulse Width ≤ 300us, δ ≤ 2%

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ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise stated)

Symbols	Parameters	Test Conditions		Min.	Typ	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0	I_D = -250µA	-100			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Temperature Coefficent of Breakdown Voltage	Reference to 25°C	I_D = -1.0mA		-0.11		V/°C
$R_{DS(on)}$	Static Drain-Source On-State Resistance	V_{GS} = -10V	I_D = -24A (4)			0.06	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}	I_D = -250µA	-2		-4	V
g_{fs}	Forward Transconductance	V_{DS} = -50V	I_{DS} = -21A (4)	10			S(℧)
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS} = 0	V_{DS} = -100V			-25	µA
		V_{GS} = 0	V_{DS} = -80V, T_J = 150°C			-250	
I_{GSS}	Forward Gate-Source Leakage	V_{GS} = 20V				100	nA
I_{GSS}	Reverse Gate-Source Leakage	V_{GS} = -20V				-100	

DYNAMIC CHARACTERISTICS

Symbols	Parameters	Test Conditions	Min.	Typ	Max.	Units
C_{iss}	Input Capacitance	V_{GS} = 0		2700		pF
C_{oss}	Output Capacitance	V_{DS} = 25V		790		
C_{rss}	Reverse Transfer Capacitance	f = 1.0MHz		450		
Q_g	Total Gate Charge	V_{GS} = -10V			180	nC
Q_{gs}	Gate-Source Charge	I_D = -21A			25	
Q_{gd}	Gate-Drain Charge	V_{DS} = -80V			97	
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = -50V		17		ns
t_r	Rise Time	I_D = -21A		86		
$t_{d(off)}$	Turn-Off Delay Time			79		
t_f	Fall Time	R_G = 2.5Ω R_D = 2.4Ω		81		

SOURCE-DRAIN DIODE CHARACTERISTICS

Symbols	Parameters	Test Conditions		Min.	Typ	Max.	Units
I_S	Continuous Source Current					-34	A
I_{SM}	Pulse Source Current (1)					-120	
V_{SD}	Diode Forward Voltage	I_S = -24A, V_{GS} = 0	T_J = 25°C			1.6	V
t_{rr}	Reverse Recovery Time	I_S = -21A	T_J = 25°C		170	260	ns
Q_{rr}	Reverse Recovery Charge	V_{DD} ≤ 50V	di/dt = 100A/µs (4)		1.2	1.8	µC

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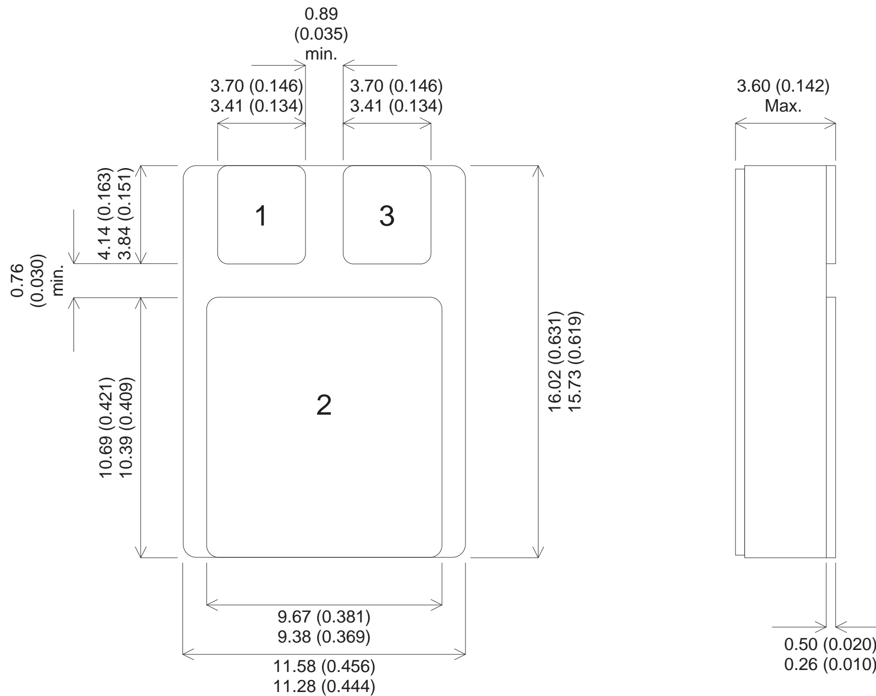
MECHANICAL DATA

Dimensions in mm (inches)



SMD1 (TO-276AB)

Underside View

Pad 1 – Source   Pad 2 – Drain   Pad 3 – Gate

Note

IRF5210SMD also available with pads 1 and 3 reversed.