

RoHS
Compliant



Features

- $V_{DS(V)} = 100V$
- $I_D = -38A$
- $R_{DS(ON)} < 60m\Omega @ V_{GS} = -10V$
- Ultra Low On-Resistance
- Fast Switching
- Advanced Process Technology

Absolute Maximum Ratings ($T_C = 25^\circ C$) Unless otherwise noted

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-100	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current, $V_{GS} @ -10V$	$T_C = 25^\circ C$	I_D	A
	$T_C = 100^\circ C$	-38	
Pulsed Drain Current	Note 1	I_{DM}	-140
Single Pulse Avalanche Energy	Note 2	E_{AS}	120
Avalanche Current	Note 1	I_{AR}	-23
Repetitive Avalanche Energy	Note 1	E_{AR}	17
Peak Diode Recovery dv/dt	Note 3	dv/dt	-7.4
Maximum Power Dissipation	$T_A = 25^\circ C$	P_D	3.1
	$T_C = 25^\circ C$		170
Thermal Resistance, Junction-to-Case		$R_{\theta JC}$	0.75
Thermal Resistance, Junction-to-Ambient	Note 5	$R_{\theta JA}$	40
Operating Junction and Storage Temperature Range		R_{thJC}	-55 to + 150

Electrical Characteristics $T_a = 25^\circ C$

Characteristic	Symbol	Conditions	Min	Typ	Max	Unit
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A,$	-100			V
Breakdown Voltage Temp. Coefficient	$I_{DSS}/\Delta T_J$	Reference to $25^\circ C, I_D = -1mA$		-0.11	-1	$^\circ C$
Static Drain-to-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = -38A$ (Note 4)			60	$m\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-2		-4	V
Forward Transconductance	g_{FS}	$V_{DS} = -50V, I_D = -23A$	9.5			S
Drain-to-Source Leakage Current	I_{DSS}	$V_{DS} = -100V, V_{GS} = 0V$			-50	μA
		$V_{DS} = -80V, V_{GS} = 0V, T_J = 125^\circ C$			-250	

Characteristic	Symbol	Conditions	Min	Typ	Max	Unit
Gate-to-Source Leakage	I _{GSS}	V _{GS} = ±20V			±100	nA
Total Gate Charge	Q _g	I _D = -23A, V _{DS} = -80V, V _{GS} = -10V (Note 4)		150	230	nC
Gate-to-Source Charge	Q _{gs}			22	33	
Gate-to-Drain ("Miller") Charge	Q _{gd}			81	120	
Turn-On DelayTime	t _{d(on)}	V _{DD} = -50V, I _D = -23A, R _G = 2.4Ω, V _{GS} = -10V (Note 4)		14		nS
Rise Time	t _r			63		
Turn-Off DelayTime	t _{d(off)}			72		
Fall Time	t _f			55		
Input Capacitance	C _{iSS}	V _{GS} =0V, V _{DS} =25V, f=1MHz		2780		pF
Output Capacitance	C _{oSS}			800		
Reverse Transfer Capacitance	C _{rSS}			430		
Source-Drain Ratings and Characteristics						
Continuous Source Current	I _S				-38	A
Pulsed Source Current	I _{SM}				-140	
Diode Forward Voltage	V _{SD}	I _S =-23A,V _{GS} =0V (Note 4)			-1.6	V
Reverse Recovery Time	t _{rr}	I _F = -23A, V _{DD} = -25V, di/dt = -100A/μs (Note 4)			260	nS
Reverse Recovery Charge	Q _{rr}				1770	nC

NOTES:

1. Repetitive rating: pulse width limited by max. junction temperature.
2. Starting T_J=25°C, L=0.46mH, R_G=25Ω, I_{AS}=-23A.
3. I_{SD}≤-23A, di/dt≤-650A/μs, V_{DD}≤ V_{(BR)DSS}, T_J≤ 150°C.
4. Pulse width ≤ 300μs; duty cycle ≤ 2%.
5. When mounted on 1" square FR-4 PCB.

Typical Characteristics

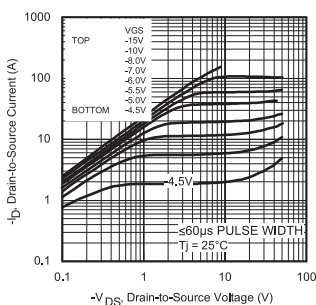


Fig 1. Typical Output Characteristics

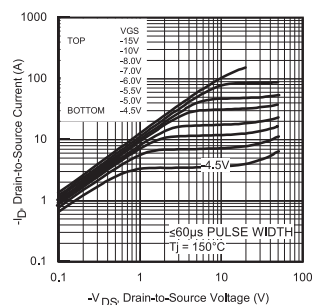


Fig 2. Typical Output Characteristics

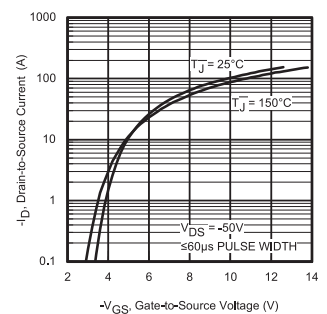


Fig 3. Typical Transfer Characteristics

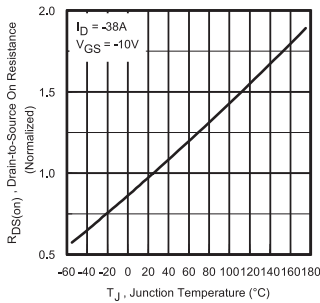


Fig 4. Normalized On-Resistance vs. Temperature

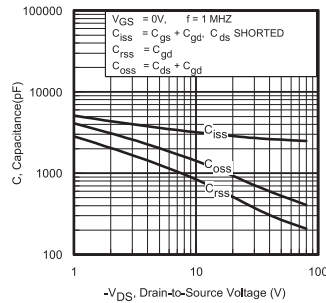


Fig 5. Typical Capacitance vs. Drain-to-Source Voltage

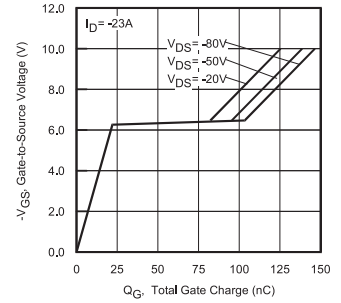


Fig 6. Typical Gate Charge vs. Gate-to-Source Voltage

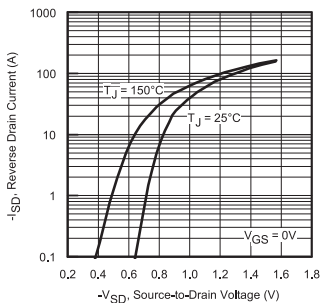


Fig 7. Typical Source-Drain Diode Forward Voltage

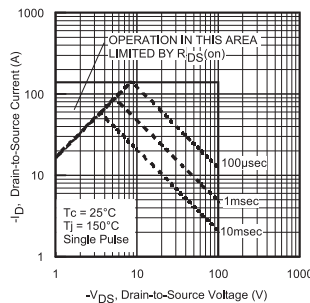


Fig 8. Maximum Safe Operating Area

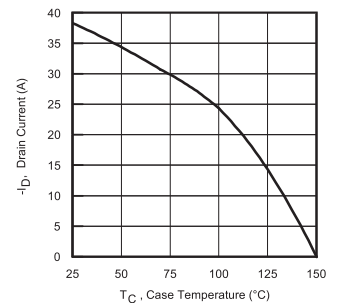


Fig 9. Maximum Drain Current vs. Case Temperature

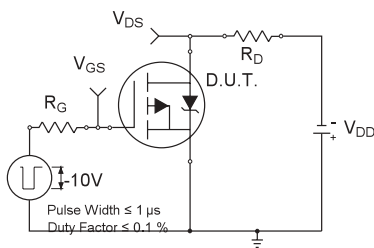


Fig 10a. Switching Time Test Circuit

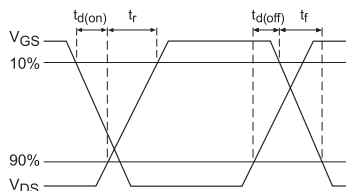


Fig 10b. Switching Time Waveforms

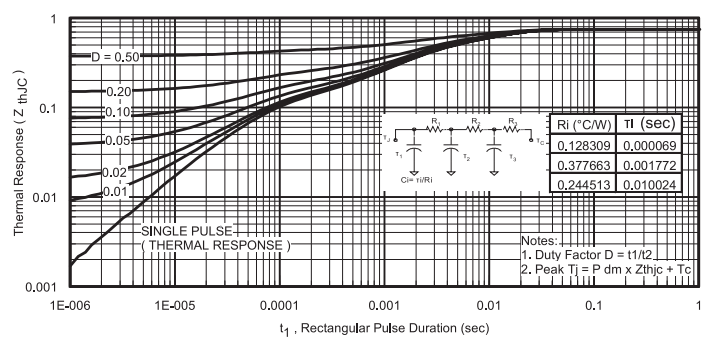
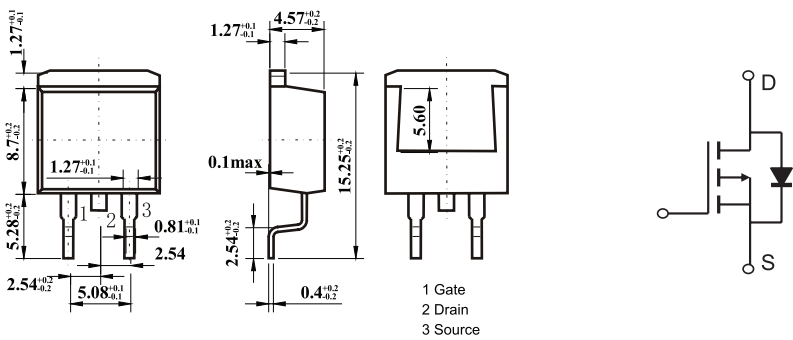


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

Diagram



Part Number Table

Description	Part Number
P Channel MOSFET, -38A, 100V, TO263	IRF5210S

Dimensions : Millimetres

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