

N-Channel 60V (D-S) Power MOSFET

Features

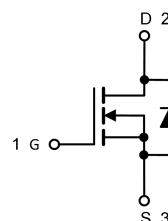
- 100% Avalanche Tested
- Extremely Low Losses with Low FOM $R_{DS(on)} \cdot Q_g$
- Halogen Free, Pb-Free
- RoHS Compliant



TO-252 (D-PAK)

Applications

- DC/DC
- Motors, lamps
- Power switching



Absolute Maximum Ratings ($T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain Source Voltage	V_{DS}	60	V
Gate Source Voltage	V_{GS}	± 20	V
Drain Current, Continuous $V_{GS}=10\text{V}$	I_D	80	A
Drain Current, Pulsed (Note 1)	I_{DM}	320	A
Single Avalanche Energy (Note 2)	E_{AS}	398	mJ
Power Dissipation	P_D	108	W
Operating Junction/ Storage Temperature Range	T_J / T_{STG}	-55 to +150	$^\circ\text{C}$

Note 1: Single pulse; $t_p \leq 1\text{us}$.

Note 2: $V_{DD} = 20\text{V}$, $V_{GS} = 10\text{V}$, $L = 0.5\text{mH}$, $R_G = 25\Omega$, starting $T_J = 25^\circ\text{C}$.

Thermal Characteristics

Parameter	Symbol	Max	Unit
Thermal Resistance Junction to Case	R_{thJC}	1.4	$^\circ\text{C/W}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	60	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V	--	--	1	uA
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _{DS} =250uA	2	--	4	V
Gate Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
Drain-Source On-state Resistance (Note 4)	R _{DS(on)}	V _{GS} =20V, I _D =20A	--	5.7	8	mΩ
Total Gate Charge	Q _g	V _{GS(off)} =0V, V _{GS(on)} =15V, V _{DD} =30V, I _D =30A	--	71.2	--	nC
Gate-Source Charge	Q _{gs}		--	16.4	--	
Gate-Drain Charge	Q _{gd}		--	23.3	--	
Turn-on Delay Time	t _{d(on)}	V _{GS} =10V, V _{DD} =30V, I _D =30A, R _G =3Ω	--	18.6	--	ns
Turn-on Rise Time	t _r		--	11.6	--	
Turn-off Delay Time	t _{d(off)}		--	106	--	
Turn-off Fall Time	t _f		--	60.8	--	
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =50V, f=1MHz	--	3934	--	pF
Output Capacitance	C _{oss}		--	209	--	
Reverse Transfer Capacitance	C _{rss}		--	191	--	

Reverse Diode Characteristics (T_J = 25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Forward Current, Continuous	I _{SD}	T _C =25°C	--	--	80	A
Diode Forward Voltage (Note 3)	V _{SD}	I _F =30A, V _{GS} =0V	--	--	1.2	V
Reverse Recovery Time	T _{rr}	I _F = 30A, di/dt = 100 A/μs	--	31.4	--	ns
Reverse Recovery Charge	Q _{rr}		--	31.1	--	nC

Note 3: Pulse test; pulse width ≤ 380μs, duty cycle ≤ 1%.

Typical Characteristics Curves ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Fig.1 - Output Characteristics

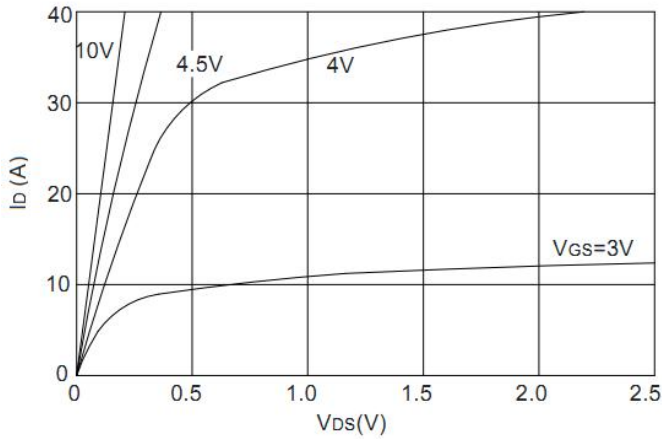


Fig.2 - Transfer Characteristics

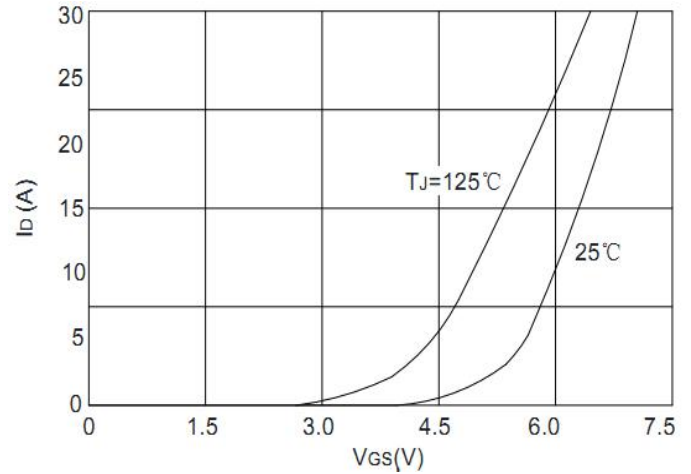


Fig.3 - Gate to Source Cut-off Voltage

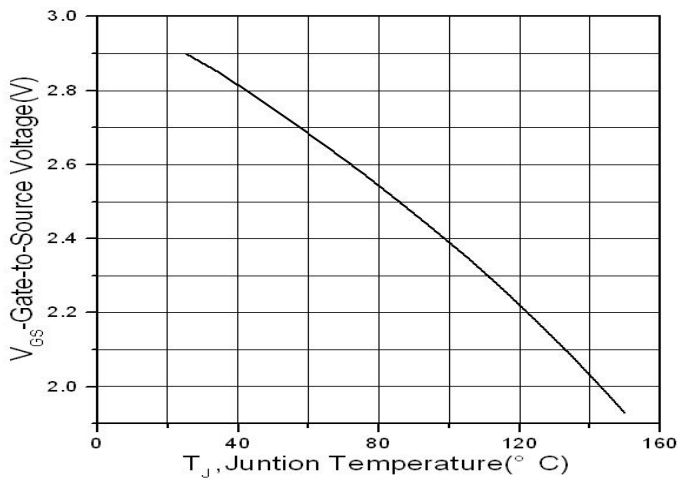


Fig.4 - Body Diode Characteristics

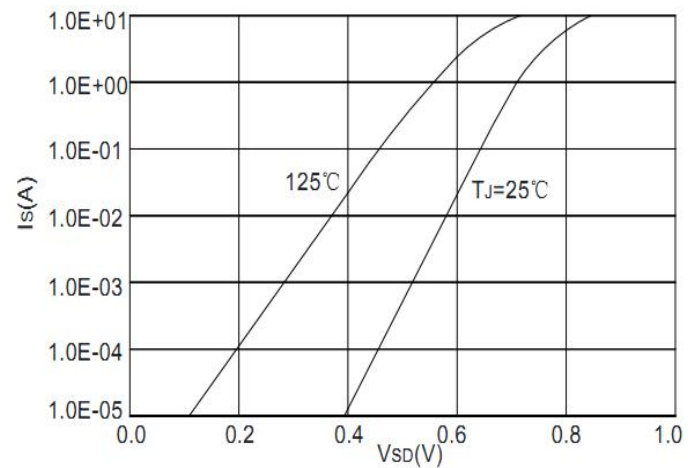


Fig.5 - Gate Charge

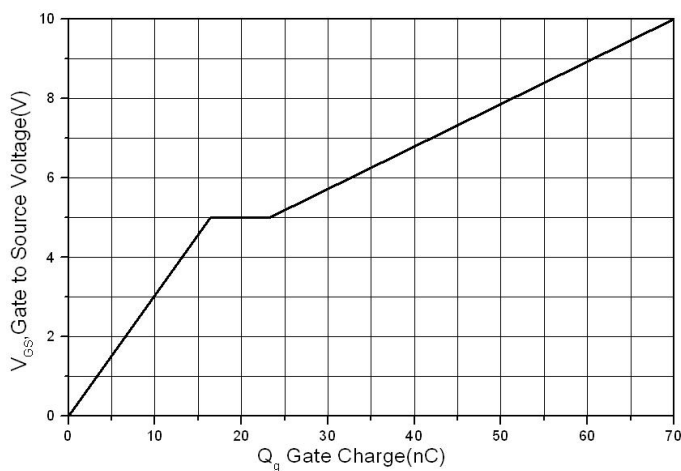
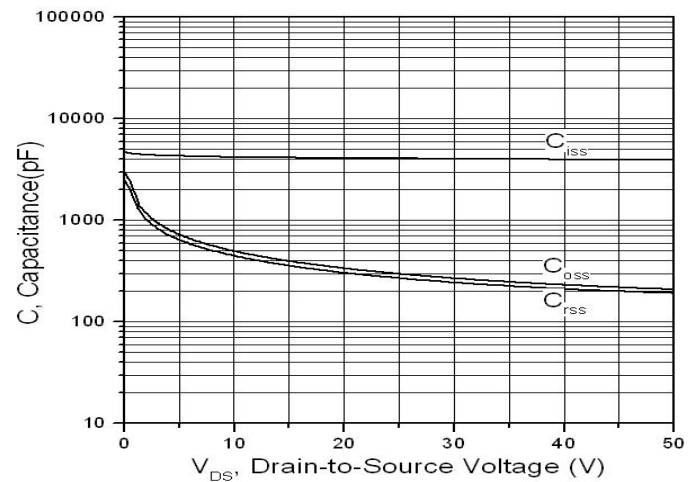


Fig.6 - Capacitance



Typical Characteristics Curves ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Fig.7 - Drain-to-Source Breakdown Voltage vs. Temperature

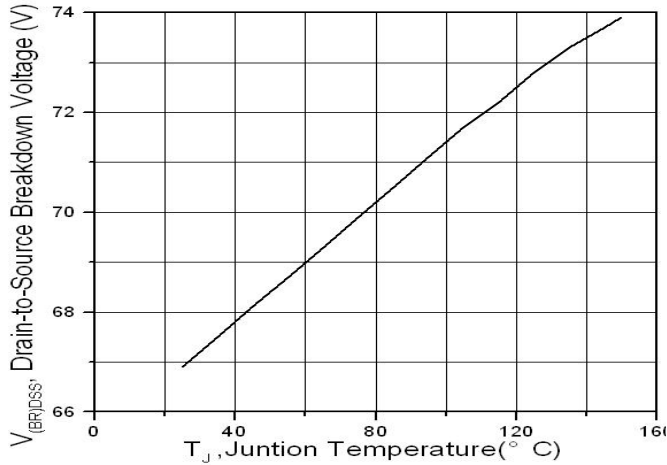


Fig.8 - Normalized On-Resistance vs. Junction Temperature

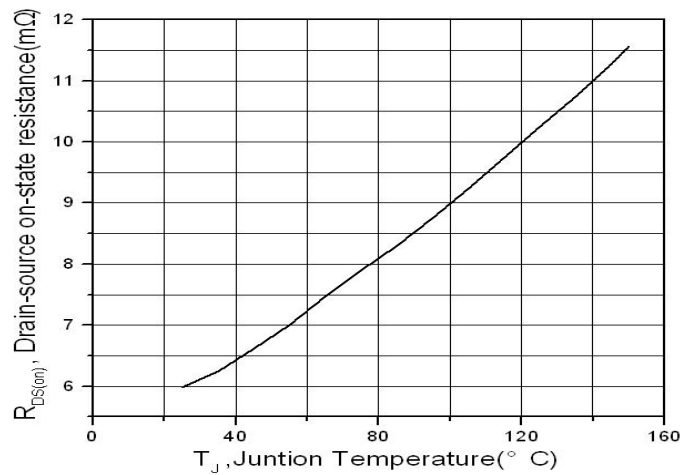


Fig.9 - Safe Operating Area

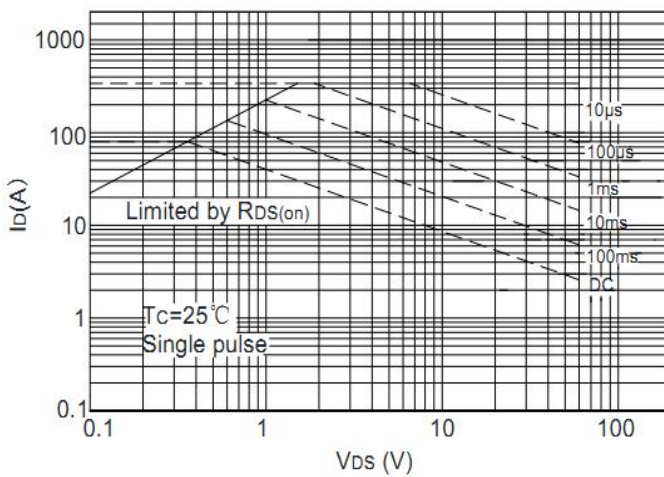


Fig.10 - Drain Current vs. Case Temperature

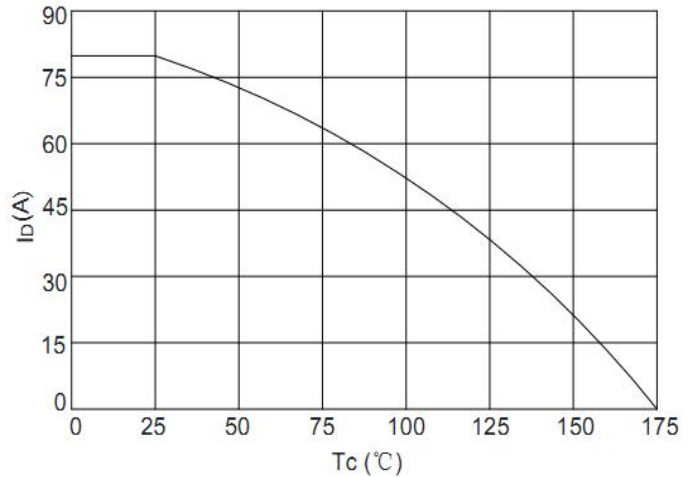
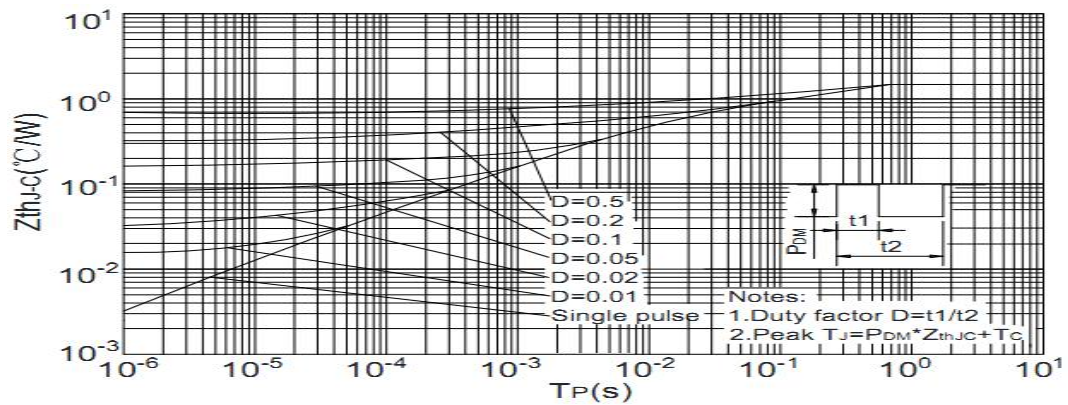
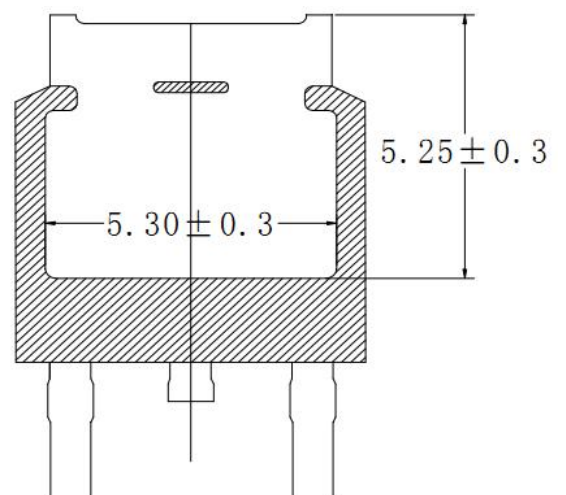
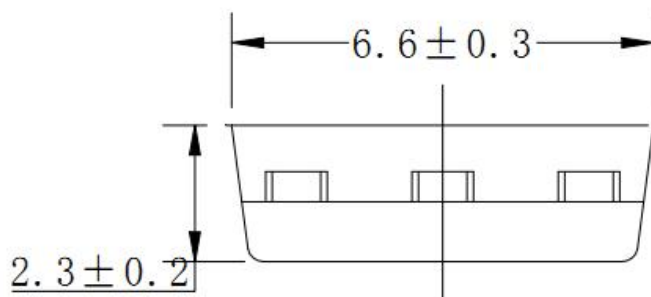
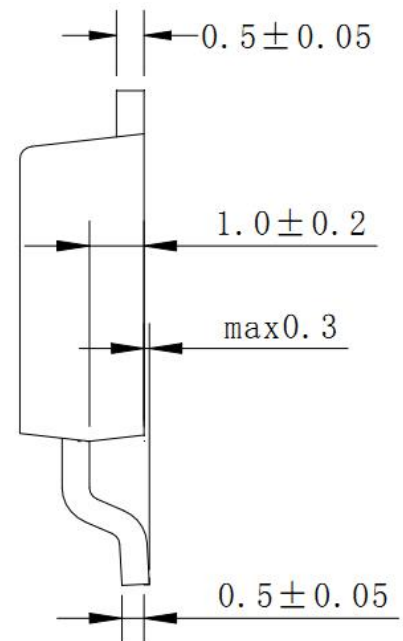
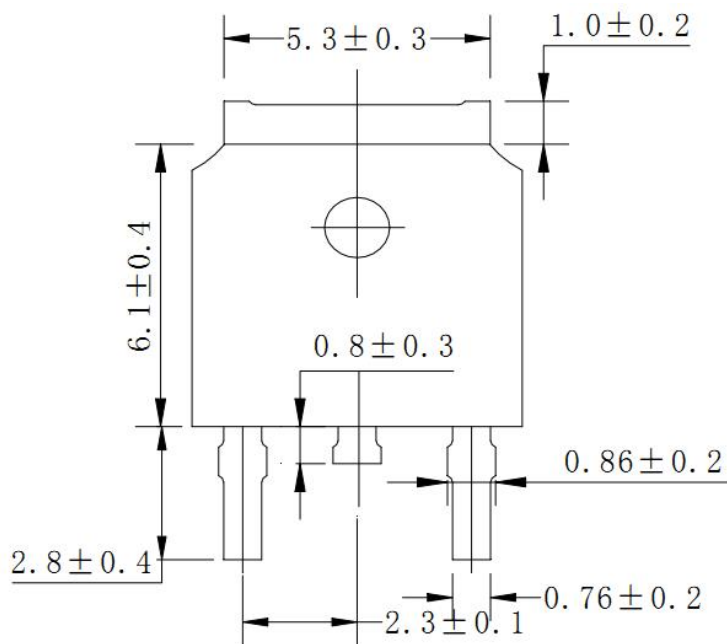


Fig.11 - Normalized Maximum Transient Thermal Impedance



Package Outline Dimensions (Unit: millimeters)

TO-252(D-PAK)



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