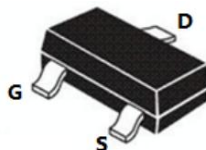
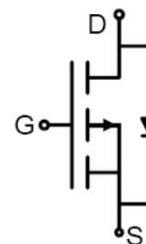


Main Product Characteristics:

V_{DSS}	-12V
$R_{DS(on)}$	13.3m Ω (typ.)
I_D	-9A


SOT23-3L

Schematic Diagram
Features and Benefits:

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature


Description:

It utilizes the latest processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

Absolute Max Rating:

Symbol	Parameter	Max.	Units
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	-9	A
$I_D @ T_C = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	-5.8	
I_{DM}	Pulsed Drain Current ②	-36	
$P_D @ T_C = 25^\circ\text{C}$	Power Dissipation ③	2	W
V_{DS}	Drain-Source Voltage	-12	V
V_{GS}	Gate-to-Source Voltage	± 12	V
E_{AS}	Single Pulse Avalanche Energy @ $L=0.5\text{mH}$	20	mJ
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

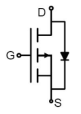
Thermal Resistance

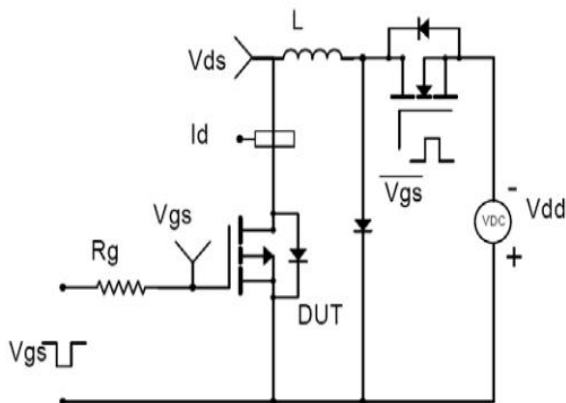
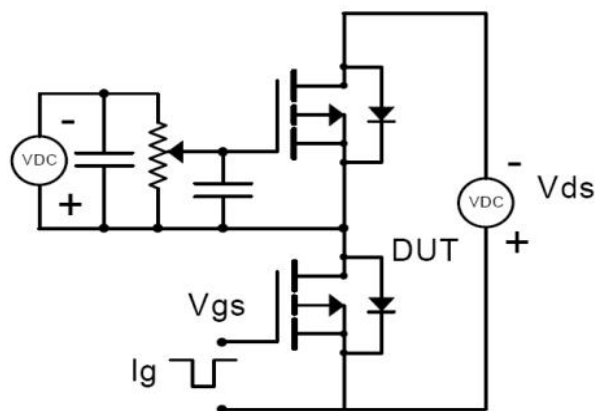
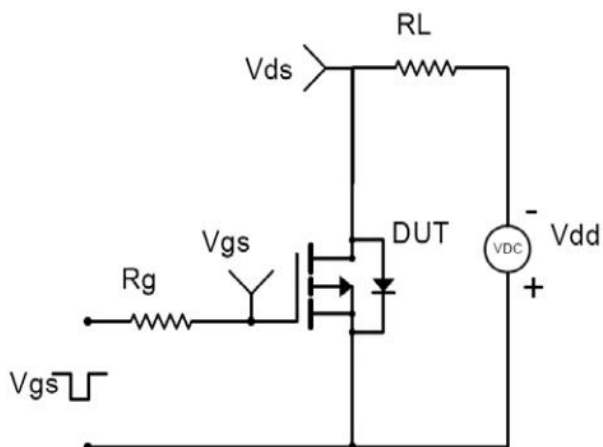
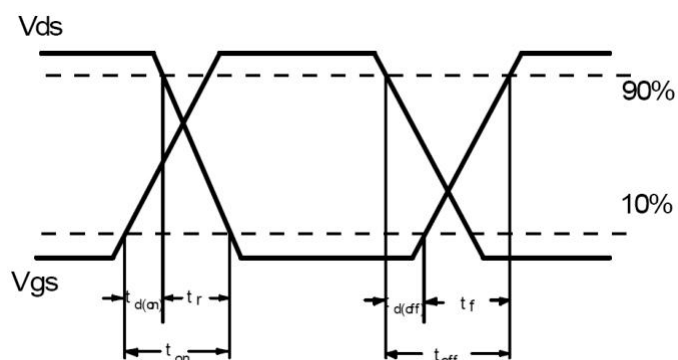
Symbol	Characterizes	Typ.	Max.	Units
R _{θJA}	Junction-to-ambient (t ≤ 10s) ④	—	63	°C/W

Electrical Characterizes @T_A=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source breakdown voltage	-12	—	—	V	V _{GS} = 0V, I _D = -250μA
R _{DS(on)}	Static Drain-to-Source on-resistance	—	13.3	18	mΩ	V _{GS} = -4.5V, I _D = -5A
		—	18.4	25		V _{GS} = -2.5V, I _D = -4A
V _{GS(th)}	Gate threshold voltage	-0.5	—	-1	V	V _{DS} = V _{GS} , I _D = -250μA
I _{DSS}	Drain-to-Source leakage current	—	—	-1	μA	V _{DS} = -12V, V _{GS} = 0V
I _{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V _{GS} = 12V
		—	—	-100		V _{GS} = -12V
C _{iss}	Input capacitance	—	1470	—	pF	V _{GS} = 0V
C _{oss}	Output capacitance	—	312	—		V _{DS} = -25V
C _{rss}	Reverse transfer capacitance	—	290	—		f = 1MHz
Q _g	Total gate charge	—	20	—	nC	I _D = -5A,
Q _{gs}	Gate-to-Source charge	—	5	—		V _{DS} = -6V,
Q _{gd}	Gate-to-Drain("Miller") charge	—	6	—		V _{GS} = -10V
t _{d(on)}	Turn-on delay time	—	14.4	—	ns	V _{GS} = -10V, V _{DS} = -6V, R _{GEN} = 3Ω, R _L = 2Ω
t _r	Rise time	—	5.5	—		
t _{d(off)}	Turn-Off delay time	—	59.4	—		
t _f	Fall time	—	21.6	—		

Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	—	—	-9	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I _{SM}	Pulsed Source Current (Body Diode)	—	—	-36	A	
V _{SD}	Diode Forward Voltage	—	—	-1.2	V	I _S = -10A, V _{GS} = 0V
t _{rr}	Reverse Recovery Time	—	31.2	—	ns	T _J = 25°C, I _F = -10A, di/dt =
Q _{rr}	Reverse Recovery Charge	—	10.9	—	nC	100A/μs

Test Circuits and Waveforms
EAS Test Circuit:

Gate Charge Test Circuit:

Switching Time Test Circuit:

Switching Waveforms:

Notes:

- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.
- ④ The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$

Typical Electrical and Thermal Characteristics

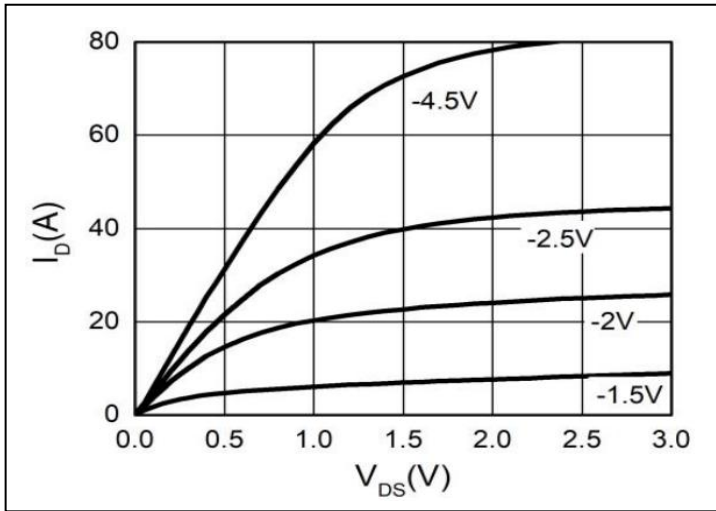


Figure 1. Typical Output Characteristics

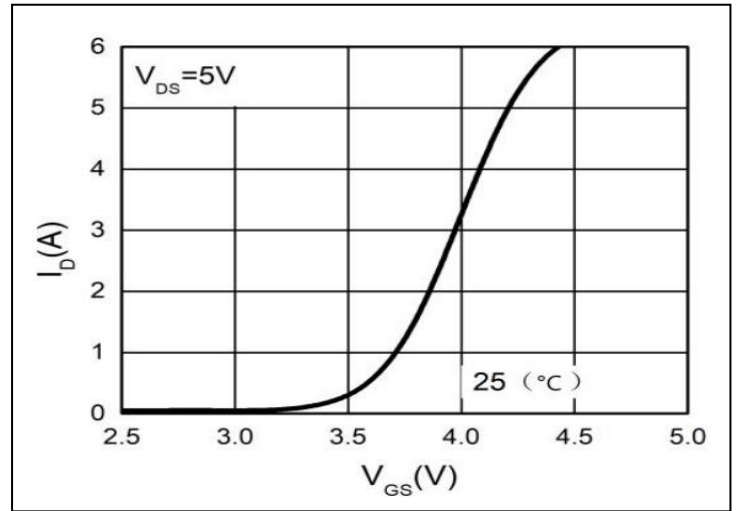


Figure 2. Transfer Characteristics

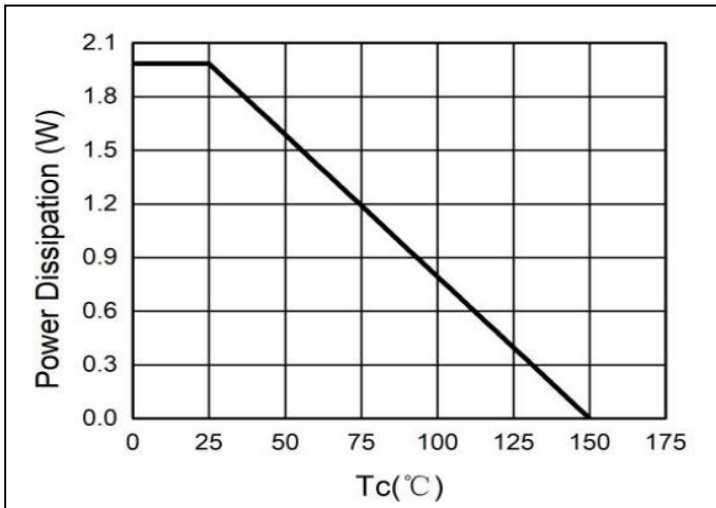


Figure 3. Power Dissipation

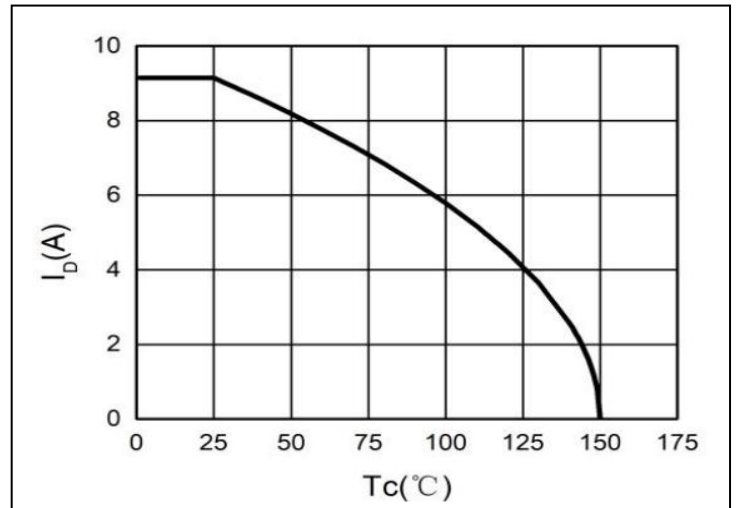


Figure 4. Drain Current

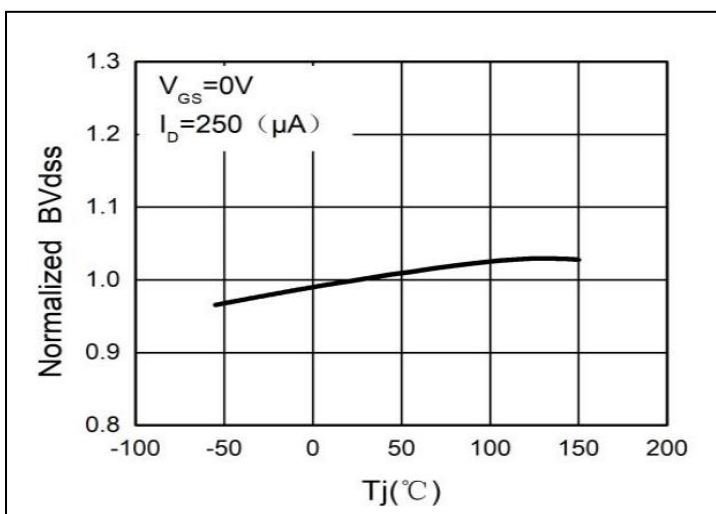


Figure 5. BV_{DS} vs Junction Temperature

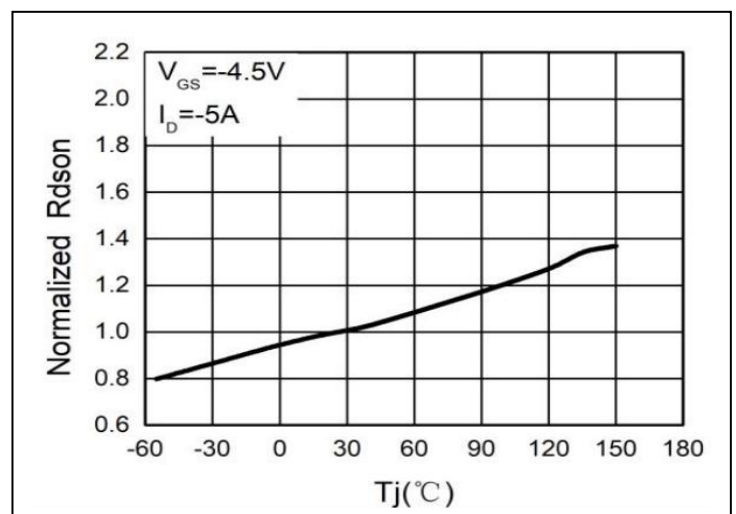


Figure 6. R_{DS(ON)} vs Junction Temperature

Typical Electrical and Thermal Characteristics

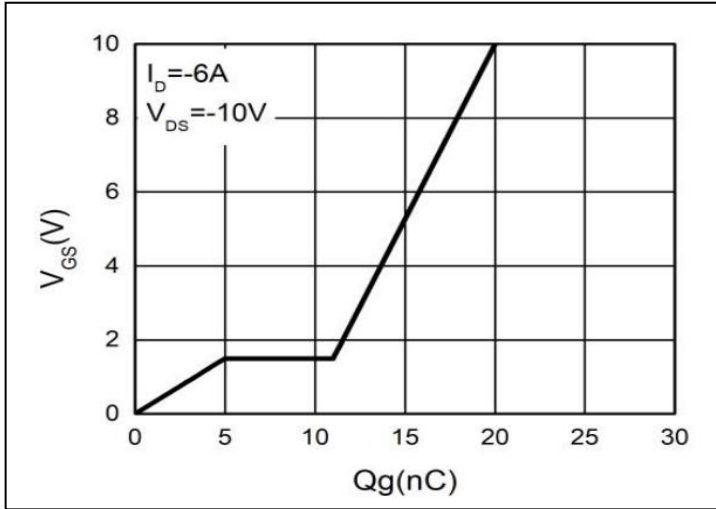


Figure 7. Gate Charge

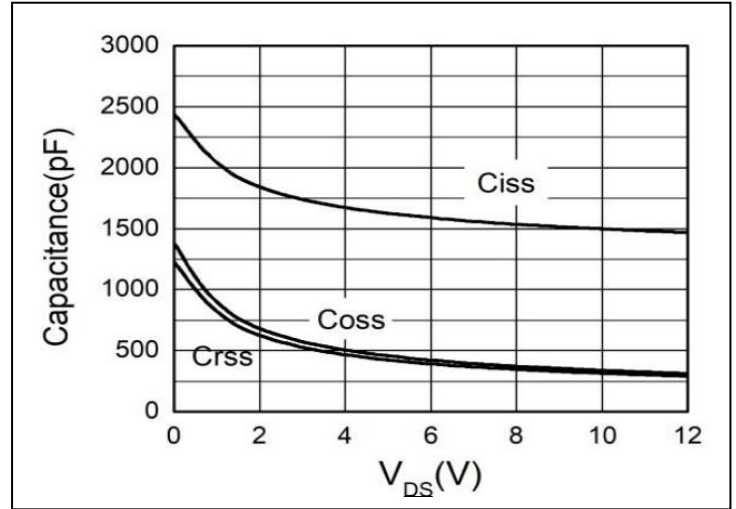


Figure 8. Capacitance

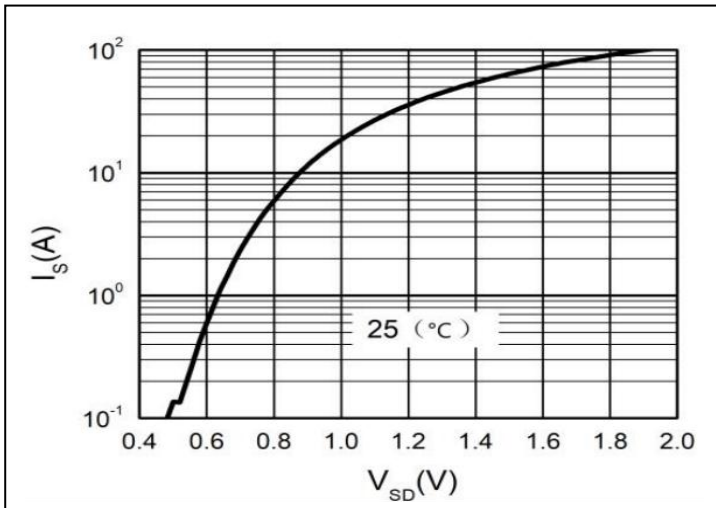


Figure 9. Body-Diode Characteristics

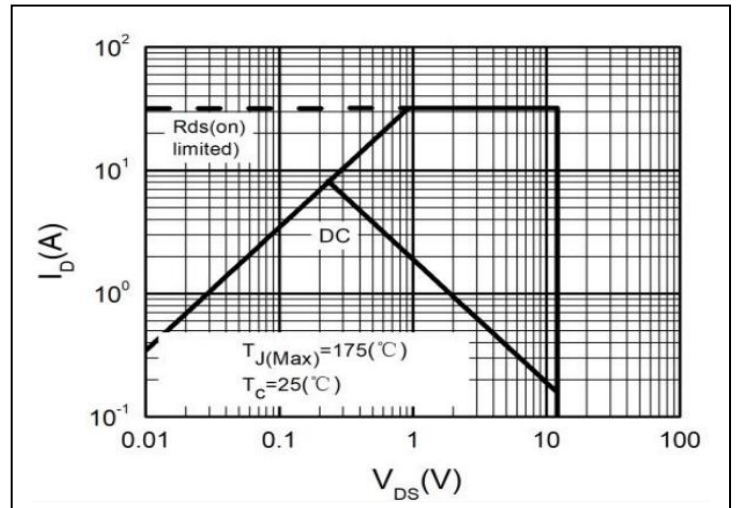
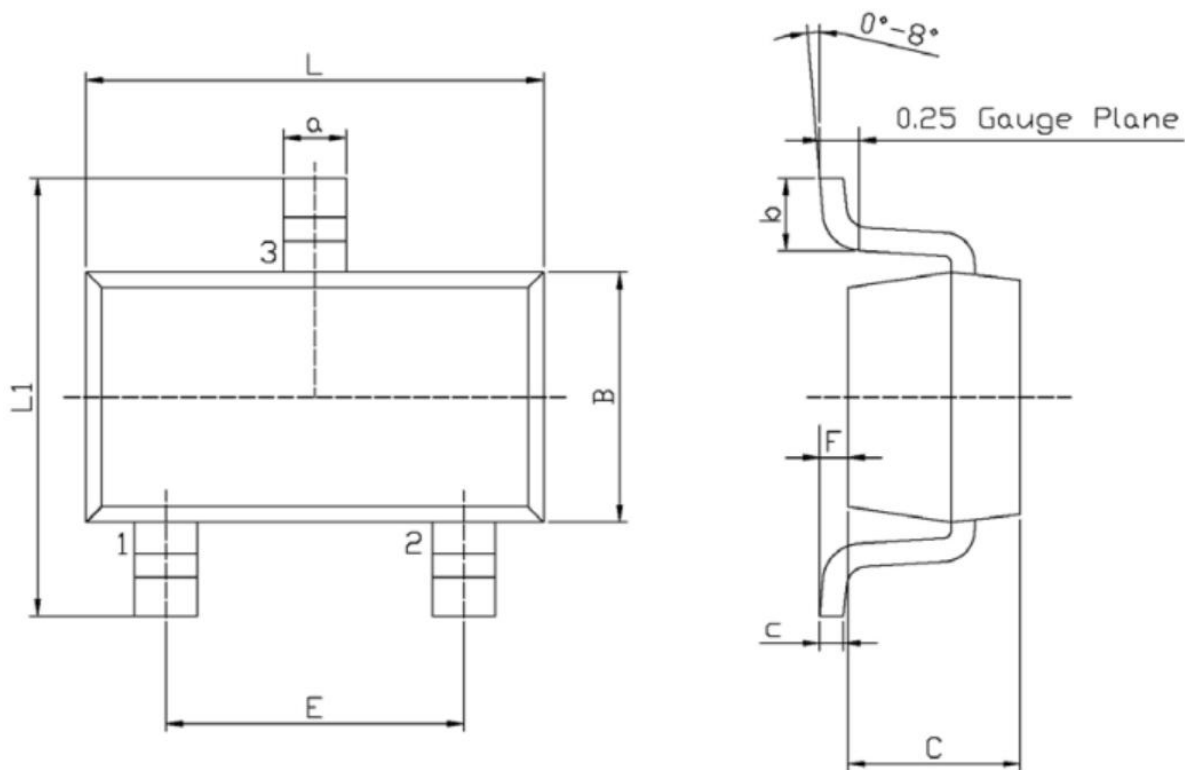


Figure 10. Maximum Safe Operating Area

Mechanical Data:



Unit: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
L	2.82	3.02	a	0.35	0.50
B	1.50	1.70	c	0.10	0.20
C	0.90	1.30	b	0.35	0.55
L1	2.60	3.00	F	0	0.15
E	1.80	2.00			

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