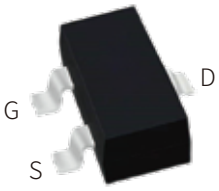
FEATURES

- High Density Cell Design For Low $R_{DS(On)}$
- Voltage Controlled Small Signal Switch
- Rugged and Reliable
- High Saturation Current Capability
- Lead free product is acquired

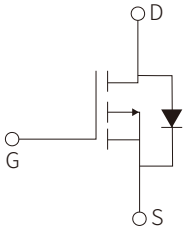


SOT-23-3L

Marking

APPLICATION

- Direct logic-level interface: TTL/CMOS
- Drivers: relays, solenoids, lamps
- hammers,display, memories, etc.
- Battery operated systems
- Solid-state relays



Schematic Symbol

APPROVALS

RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003

ABSOLUTE MAXIMUM RATINGS (T_A=25℃)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Maximum Drain Current - Continuous	I_D	-3	A
Gate-Source Voltage	V_{GS}	±12	V
Maximum Power Dissipation	P_D	1.25	W
Pulsed Diode Curren	I_{DM}	-15	A
Continuous Source-Drain Current(Diode Conduction)	I_S	-0.8	A
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	150	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{STG}	-55 to 150	℃

ELECTRICAL CHARACTERISTICS (T_A=25℃)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=-250μA	-20			V
Zero gate voltage drain current	I_{DSS}	V_{DS}=-20V,V_{GS}=0V			-1	μA
Gate-source leakage	I_{GSS}	V_{GS}=±12V,V_{DS}=0V			±100	nA
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-0.4		-1	V
Drain-source on-state resistancea	$R_{DS(on)}$	V_{GS}=-4.5V,I_D=-2.8A		66	90	mΩ
		V_{GS}=-2.5V,I_D=-2A		83	115	mΩ
Forward Transconductance	g_{fs}	V_{DS}=-4.5V,I_D=-3A		4		S
Diode forward voltage	V_{SD}	I_S=-1A,V_{GS}=0V		-0.8	-1.3	V
Dynamic Characteristics						
Input capacitance	C_{iss}	V_{DS}=-16V,V_{GS}=0V,f=1MHz		589		pF
Output capacitance	C_{oss}			92		pF
Reverse transfer capacitance	C_{rss}			68		pF
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-10V,I_D=-3A V_{GEN}=-4.5V,R_L=6Ω R_g=6Ω		10	20	nS
Turn-on Rise Time	t_r			35	60	nS
Turn-Off Delay Time	$t_{d(off)}$			30	50	nS
Turn-Off Fall Time	t_f			10	20	nS
Total Gate Charge	Q_g	V_{DS}=-16V,V_{GS}=-4.5V I_D=-3A		5.5	10	nC
Gate-Source Charge	Q_{gs}			0.8		nC
Gate-Drain Charge	Q_{gd}			1.3		nC
Gate resistance	R_g	f=1MHz		6		Ω
Drain-Source Diode Characteristics						
Pulsed Diode forward Curren	I_{SM}				-20	A
Continuous Source-Drain Diode Current	I_S	T_C=25°C			-1.3	A

PARAMETER CHARACTERISTIC CURVE

Figure 1: Power Dissipation

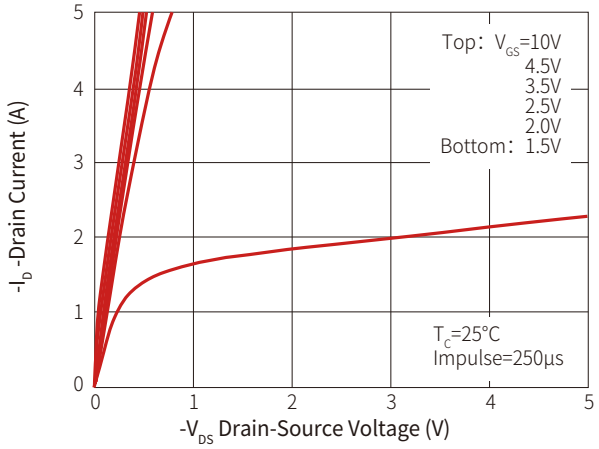


Figure 2: Transfer Characteristics

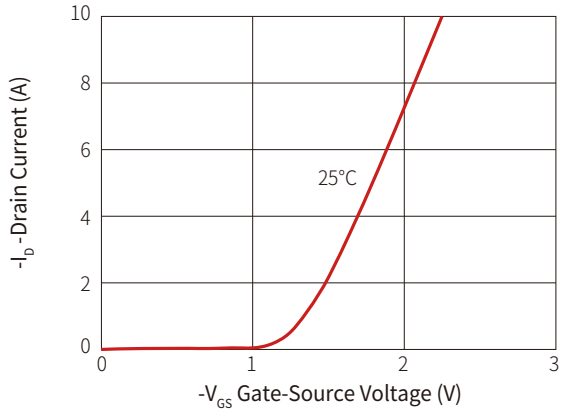


Figure 3: On-Resistance Variation

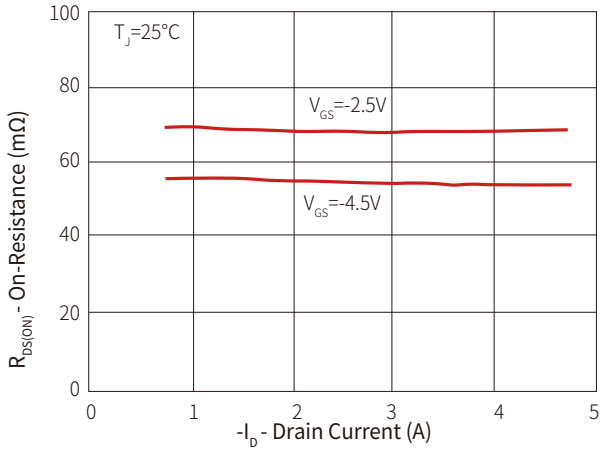


Figure 4: Body Diode Forward Voltage

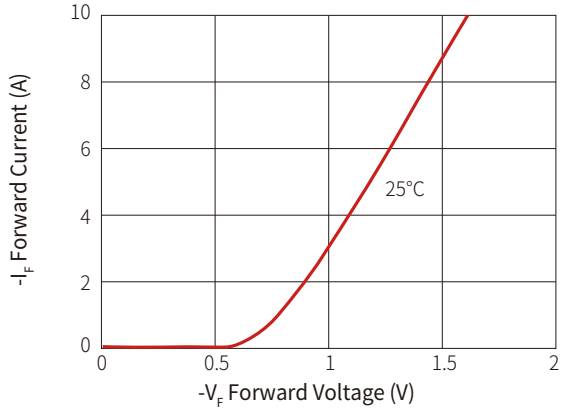


Figure 5: Capacitance Characteristics

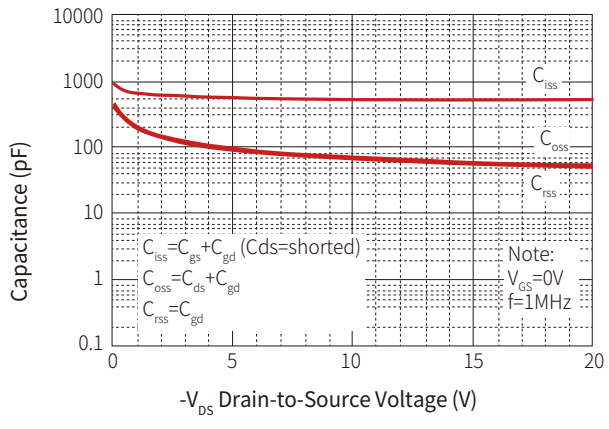


Figure 6: Gate Charge Characteristics

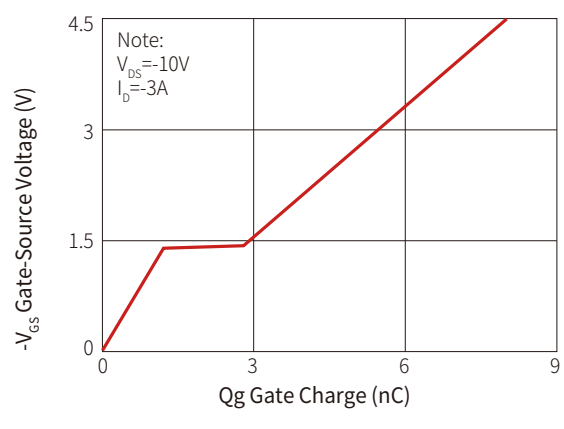


Figure 7: V_{DS} Drain-Source Voltage vs Gate Voltage

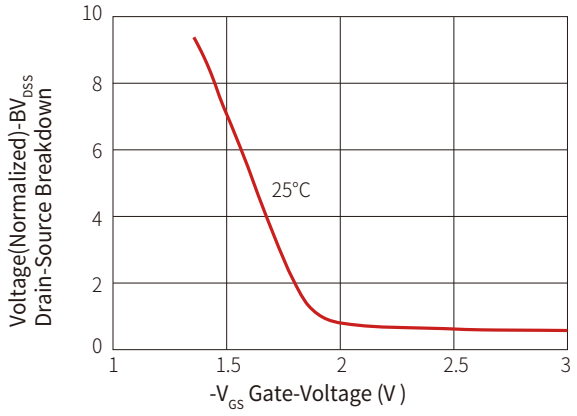


Figure 8: On-Resistance vs Gate Voltage

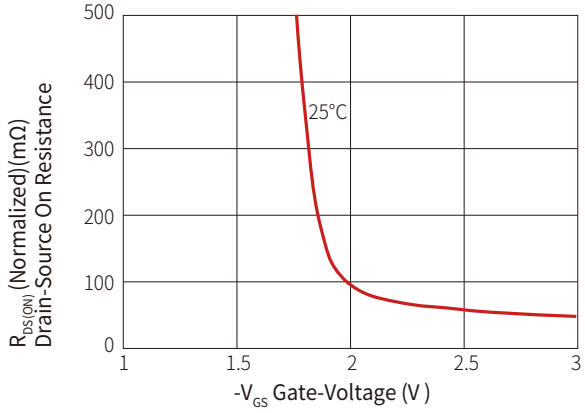


Figure 9: Maximum Safe Operating Area

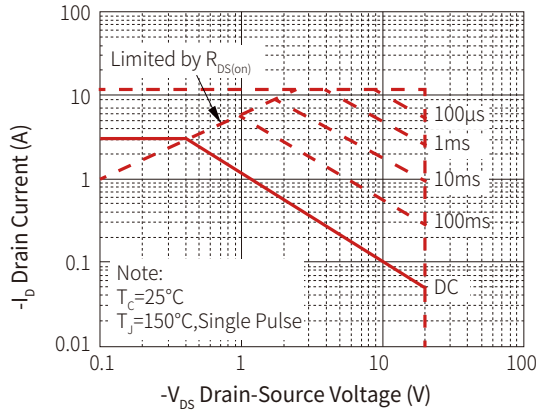


Figure 10: Maximum Continuous Drain Current vs Temperature

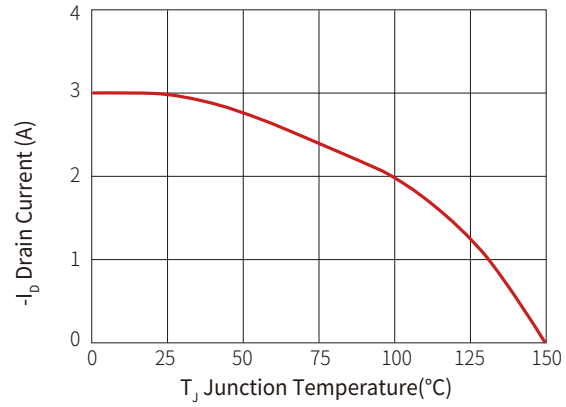
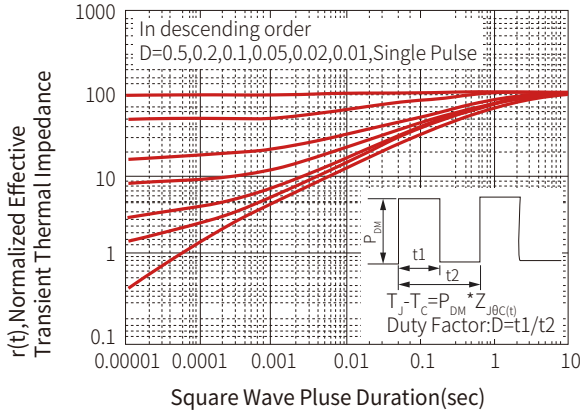
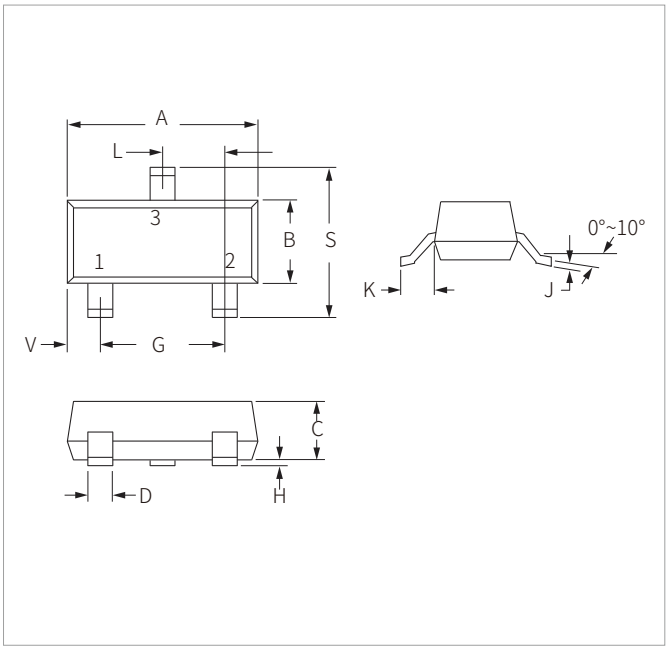


Figure 11: Transient Thermal Response Curve

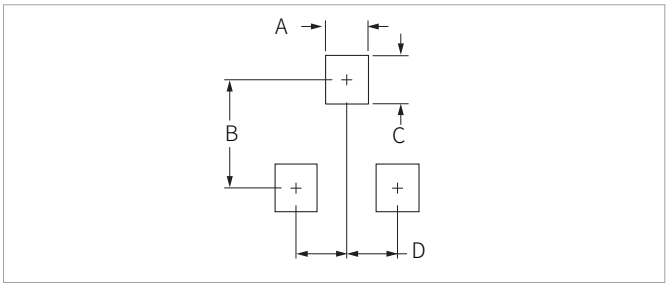


SOT-23-3L PACKAGE INFORMATION



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.80	3.15	0.110	0.124
B	1.50	1.70	0.060	0.070
C	1.00	1.30	0.039	0.051
D	0.37	0.50	0.015	0.020
G	1.78	2.10	0.070	0.083
H	0.01	0.15	0.001	0.006
J	0.08	0.18	0.003	0.007
K	0.35	0.69	0.014	0.029
L	0.89	1.02	0.035	0.040
S	2.60	3.00	0.102	0.118
V	0.45	0.60	0.018	0.024

RECOMMENDED PAD LAYOUT DIMENSIONS



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.70	1.00	0.028	0.039
B	2.30	2.50	0.090	0.098
C	0.70	1.00	0.028	0.039
D	0.80	1.10	0.032	0.043

ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SPM3P02R	SOT-23-3L	3000PCS	7”

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