

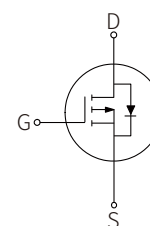
FEATURES

- | Super Low Gate Charge
- | 100% EAS Guaranteed
- | Green Device Available
- | Excellent CdV/dt effect decline
- | Advanced high cell density Trench technology



APPROVALS

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



Schematic Symbol

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Conditions	Rating	Unit
Drain-Source Voltage	V_{DS}		-100	V
Gate-Source Voltage	V_{GS}		± 20	V
Continuous Drain Current, V_{GS} @ -10V ¹	I_D	@ $T_C=25^\circ\text{C}$	-3	A
Continuous Drain Current, V_{GS} @ -10V ¹	I_D	@ $T_C=100^\circ\text{C}$	-1.2	A
Continuous Drain Current, V_{GS} @ -10V ¹	I_D	@ $T_A = 25^\circ\text{C}$	-0.75	A
Continuous Drain Current, V_{GS} @ -10V ¹	I_D	@ $T_A = 70^\circ\text{C}$	-0.6	A
Pulsed Drain Current ²	I_{DM}		-6.0	A
Single Pulse Avalanche Energy ³	EAS	$T_A = 25^\circ\text{C}$	14.5	mJ
Avalanche Current	I_{AS}		-4.5	A
Total Power Dissipation ⁴	P_D	@ $T_C=25^\circ\text{C}$	10	W
Total Power Dissipation ⁴	P_D	@ $T_A=25^\circ\text{C}$	2.0	W
Storage Temperature Range	T_{STG}		-55~+150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J		-55~+150	$^\circ\text{C}$
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$		72	$^\circ\text{C/W}$
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$		8.0	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DS}	$V_{GS}=0V, I_{DS}=-250\mu A$	-100			V
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-80V, V_{GS}=0V, T_J=25^{\circ}\text{C}$			-1	μA
		$V_{DS}=-80V, V_{GS}=0V, T_J=85^{\circ}\text{C}$			-30	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2		-2.5	V
Static Drain-Source On-Resistance ²	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-3A$		180	220	m Ω
		$V_{GS}=-4.5V, I_{DS}=-2A$		210	255	m Ω
Gate Resistance	R_g	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$		13		Ω
Total Gate Charge (-10V)	Q_g	$V_{DS} = -50V, V_{GS} = -10V$ $I_D = -2A$		19		nC
Gate-Source Charge	Q_{gs}			3.4		nC
Gate-Drain Charge	Q_{gd}			2.9		nC
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-30V, V_{GS}=-10V$ $R_G=3.3\Omega, I_D=-1A$		9		ns
Rise Time	t_r			6		ns
Turn-Off Delay Time	$t_{d(off)}$			39		ns
Fall Time	t_f			33		ns
Input Capacitance	C_{iss}	$V_{DS}=-30V, V_{GS}=0V$ $f=1\text{MHz}$		1228		pF
Output Capacitance	C_{oss}			41		pF
Reverse Transfer Capacitance	C_{rss}			29		pF

DIODE CHARACTERISTICS

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Continuous Source Current ^{1,5}	I_S	$V_G=V_D=0V$, Force Current			3	A
Diode Forward Voltage ²	V_{DS}	$V_{GS}=0V, I_S=-1A, T_J=25^{\circ}\text{C}$			-1.2	V

PARAMETER CHARACTERISTIC CURVE

Figure 1: Typical Output Characteristics

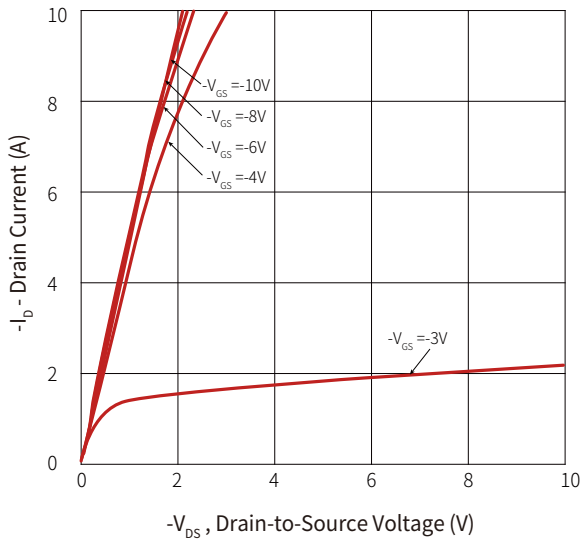


Figure 2: On-Resistance vs G-S Voltage

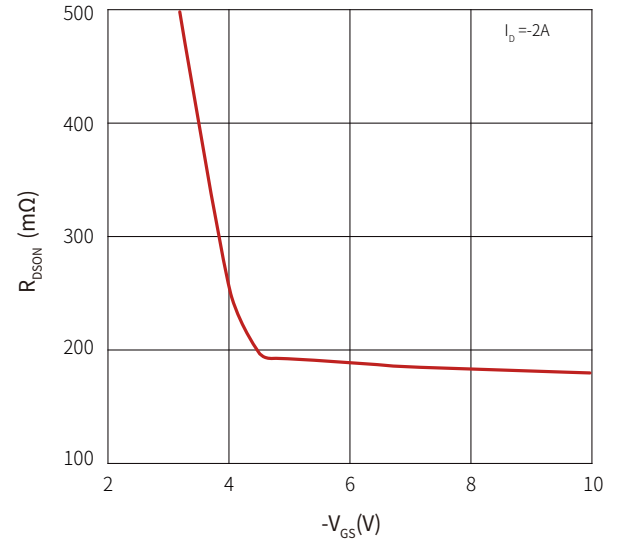


Figure 3: Source Drain Forward Characteristics

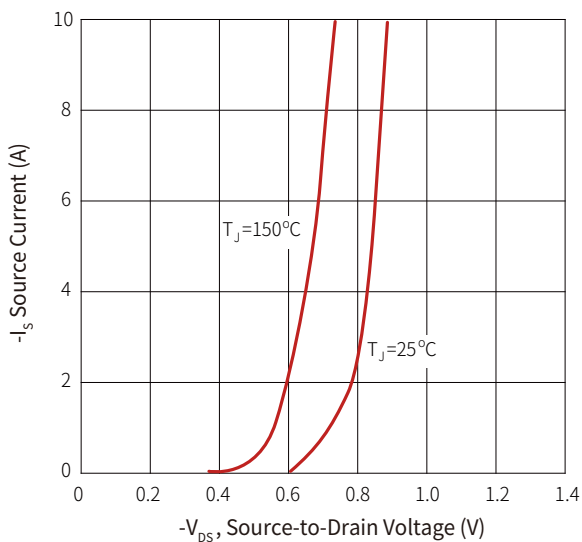


Figure 4: Gate-Charge Characteristics

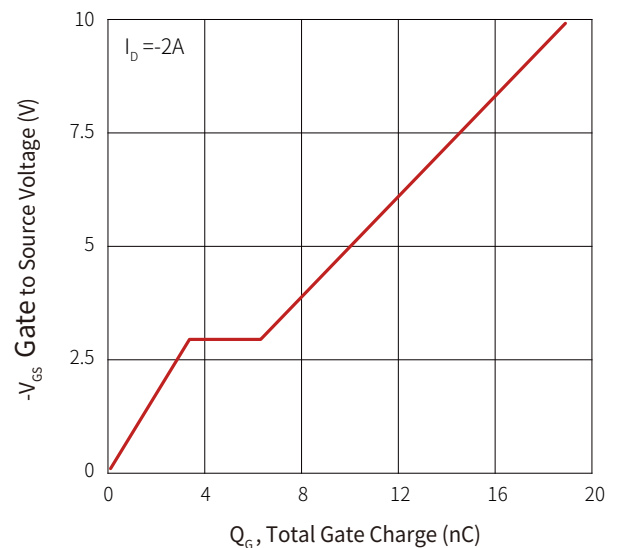


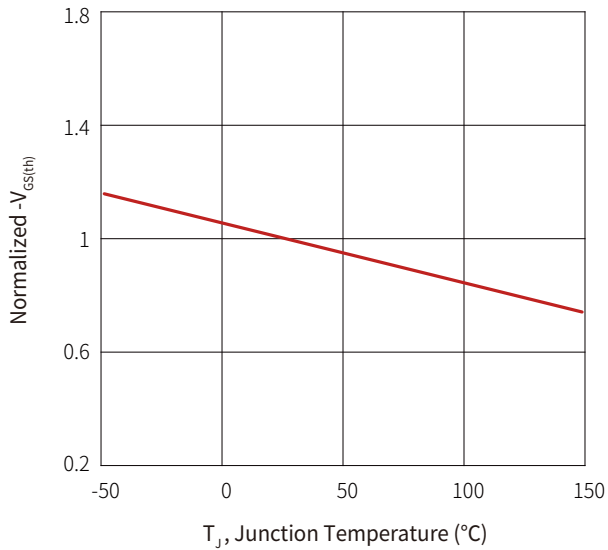
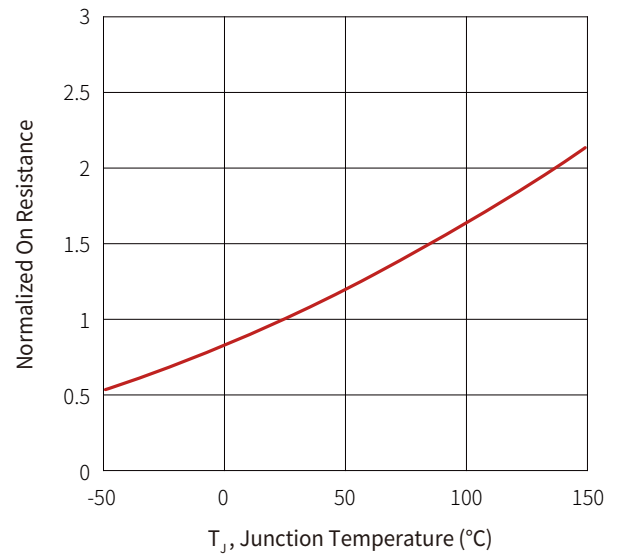
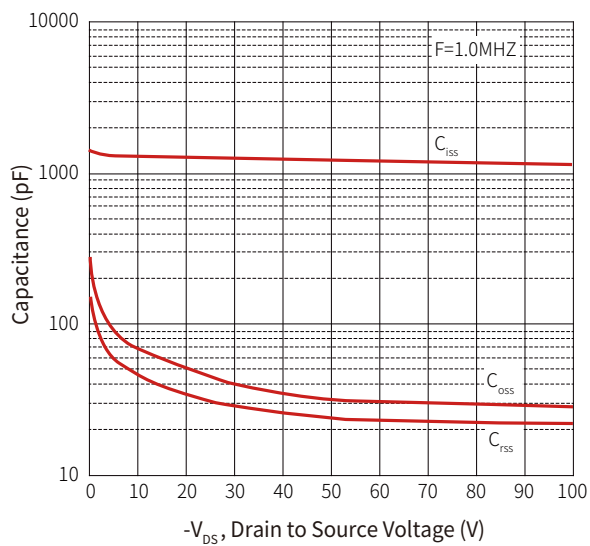
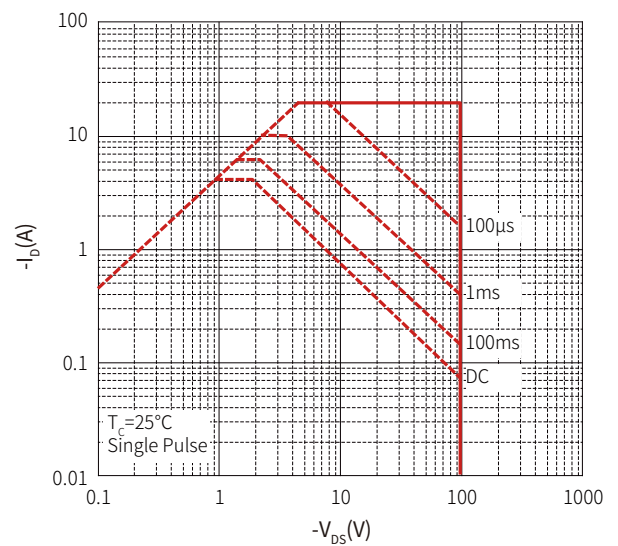
Figure 5: Normalized $V_{GS(th)}$ vs T_J

Figure 6: Normalized $R_{DS(on)}$ vs T_J

Figure 7: Capacitance

Figure 8: Safe Operating Area


Figure 9: Normalized Maximum Transient Thermal Impedance

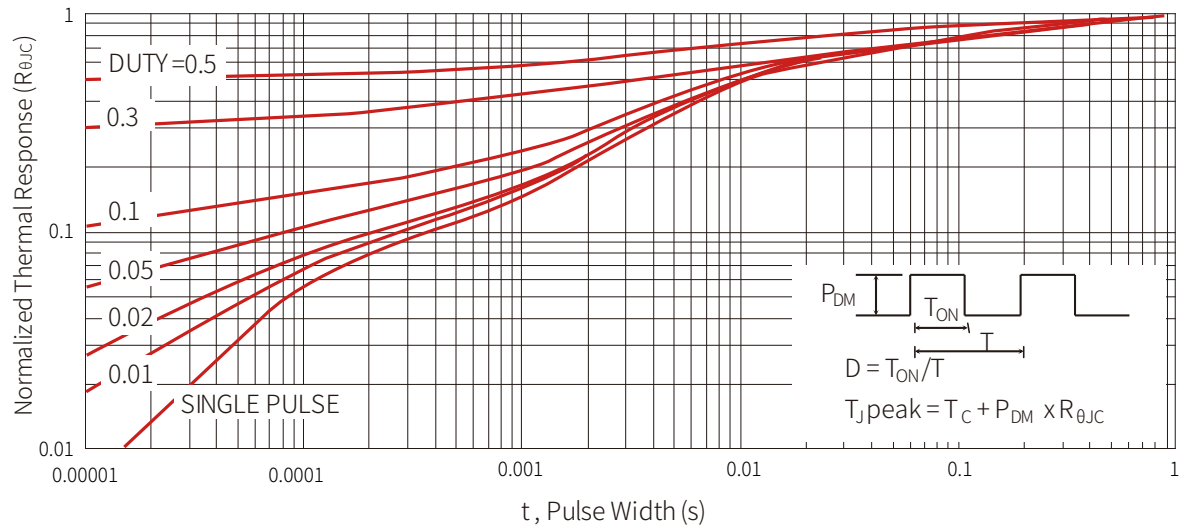


Figure 10: Switching Time Waveform

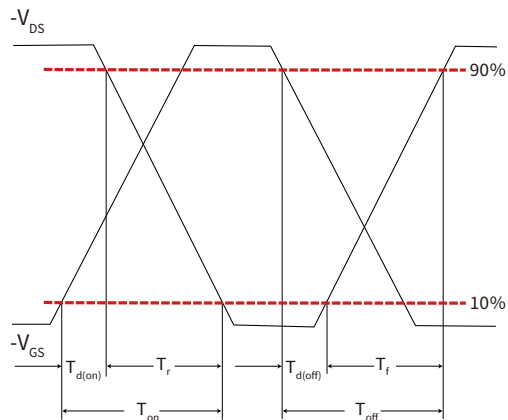
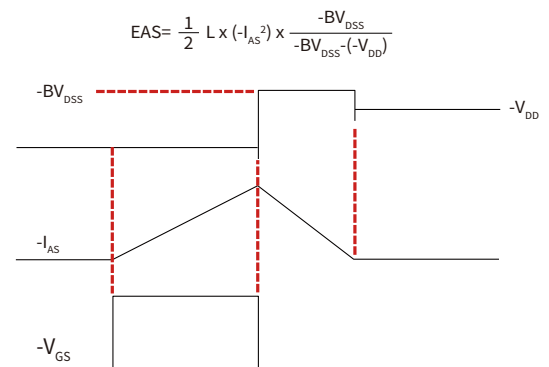
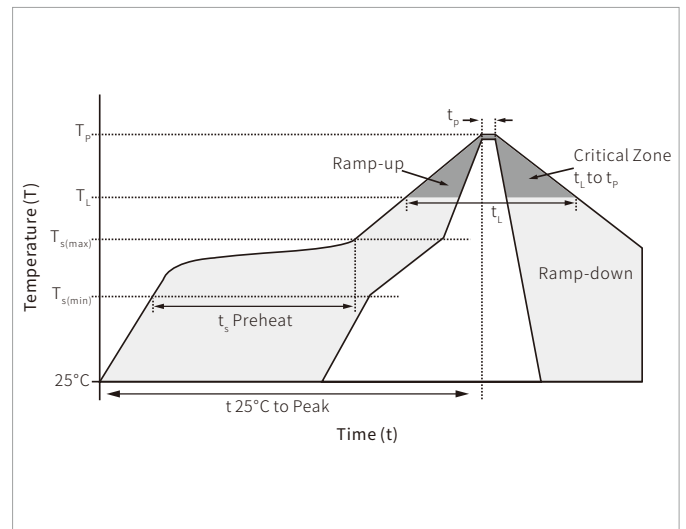


Figure 11: Unclamped Inductive Waveform

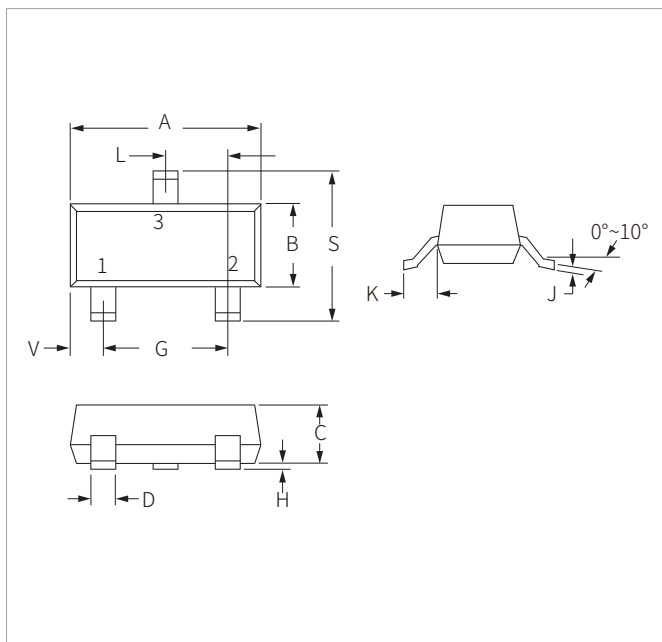


SOLDERING PARAMETERS

Reflow Condition		Lead-free assembly
Pre Heat	Temperature Max ($T_{s(min)}$)	150°C
	Temperature Max ($T_{s(max)}$)	200°C
	Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak		3°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Time (min to max) (t_L)	60 – 150 seconds
Peak Temperature (T_p)		260°C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_p)		8 minutes max.
Do not exceed		260°C

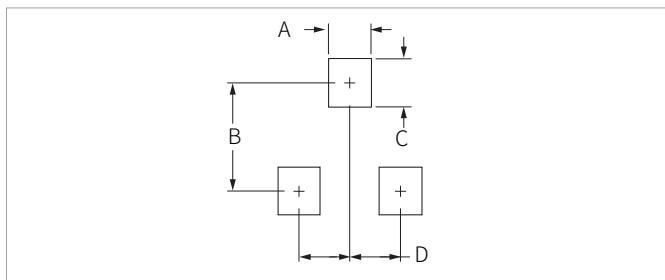


SOT-23-3L PACKAGE INFORMATION



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	0.71	0.97	0.028	0.038
B	1.88	2.13	0.074	0.084
C	0.71	0.97	0.028	0.038
D	0.81	1.07	0.032	0.042

ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SPM03P10	SOT-23-3L	3000PCS	7"

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