

FEATURES

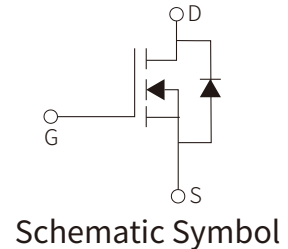
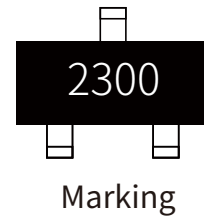
Ultra low on-resistance: $V_{DS}=20V, R_{DS(ON)} \leq 40m\Omega$

@ $V_{GS}=4.5V, I_D=4.5A$

For Low power DC to DC converter application

For Load switch application

Surface Mount device



APPLICATION

Case: SOT-23

Case Material: Molded Plastic. UL flammability

Classification Rating: 94V-0

APPROVALS

RoHS Compliance with 2011/65/EU

HF Compliance with IEC61249-2-21:2003

ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Continuous drain current	I_D	4.5	A
Pulsed drain current (Note 1)	I_{DM}	15	A
Gate-Source Voltage	V_{GS}	± 10	V
Power dissipation	P_D	1.25	W
Thermal resistance from Junction to ambient	$R_{\theta JA}$	100	$^\circ\text{C}/\text{W}$
Junction temperature	T_J	150	$^\circ\text{C}$
Storage temperature	T_{STG}	-55 to 150	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS(T_a=25°C)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-source Breakdown Voltage	BV _{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-Body Leakage	I _{GSS}	V _{GS} =±10V, V _{DS} =0V			±100	nA
Gate Threshold Voltage(Note 1)	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.5	0.78	1.5	V
Static Drain-Source On-Resistance(Note 1)	R _{DS(on)}	V _{GS} =4.5V, I _D =4.5A		32	40	mΩ
		V _{GS} =2.5V, I _D =4A		50	60	
		V _{GS} =1.8V, I _D =1A		62	75	
On-State Drain Current	I _{D(on)}	V _{DS} =5V, V _{GS} =4.5V	18			A
Forward Transconductance(Note 1)	g _{FS}	V _{DS} =5V, I _D =5A	5			S
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=1.0MHz		888		pF
Output Capacitance	C _{oss}			144		
Reverse Transfer Capacitance	C _{rss}			115		
Turn-On Delay Time	t _{d(on)}	V _{GS} =10V, R _L =10Ω V _{DD} =10V, R _{GEN} =6Ω		31.8		ns
Turn-On Rise Time	t _r			14.5		
Turn-Off Delay Time	t _{d(off)}			50.3		
Turn-Off Fall Time	t _f			31.9		
Diode forward voltage(Note 1)	V _{SD}	I _S =0.83A, V _{GS} =0V			1.25	V
Total Gate Charge	Q _g	V _{GS} =10V, V _{DD} =15V, I _D =5A		16.8		nC
Gate Source Charge	Q _{gs}			2.5		
Gate Drain Charge	Q _{gd}			5.4		
Diode forward current	I _S			0.82	1.2	A

Note:1. Pulse test ; Pulse width ≤300μs, Duty cycle ≤ 2%

PARAMETER CHARACTERISTIC CURVE

Fig 1: On-Region Characteristics

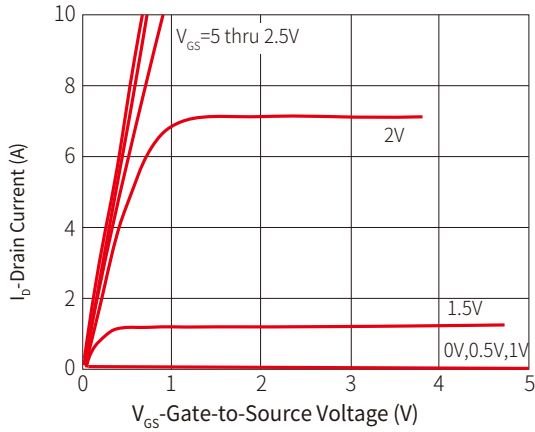


Figure 2: Transfer Characteristics

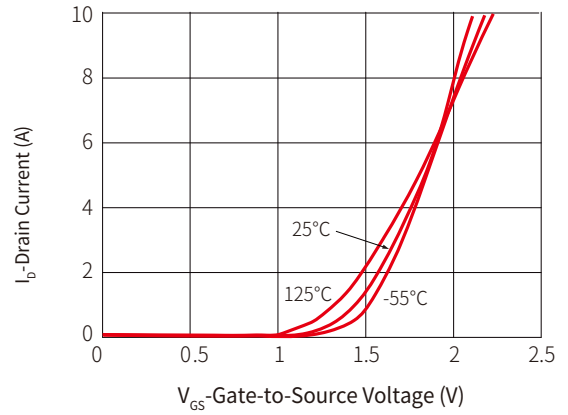


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

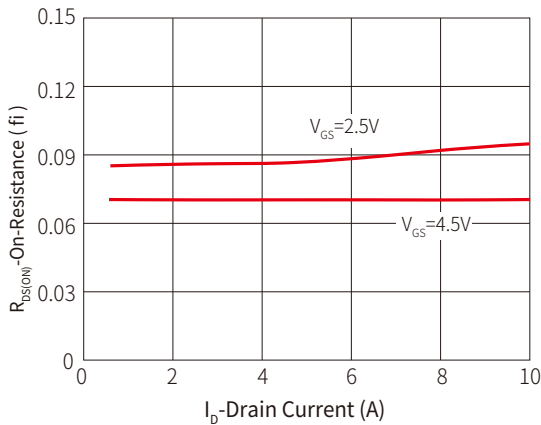


Figure 4: On-Resistance vs. Junction Temperature

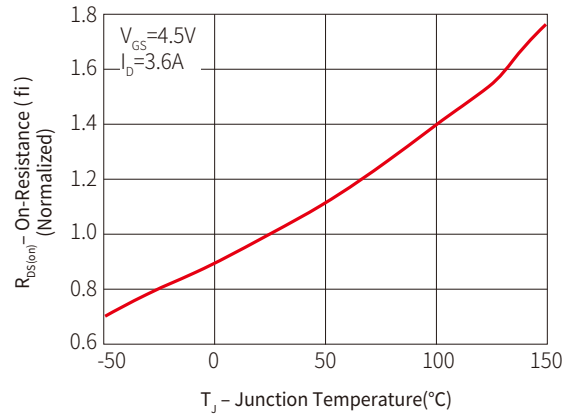


Figure 5: Capacitance

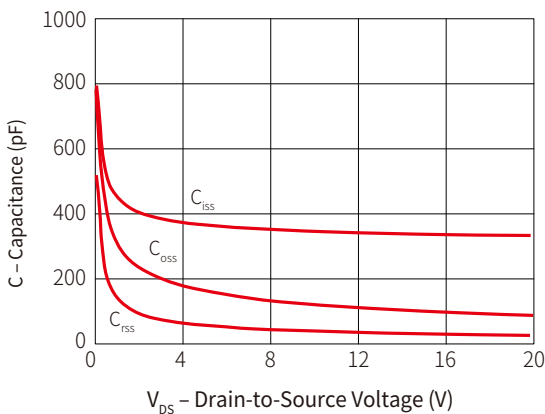


Figure 6: Gate Charge

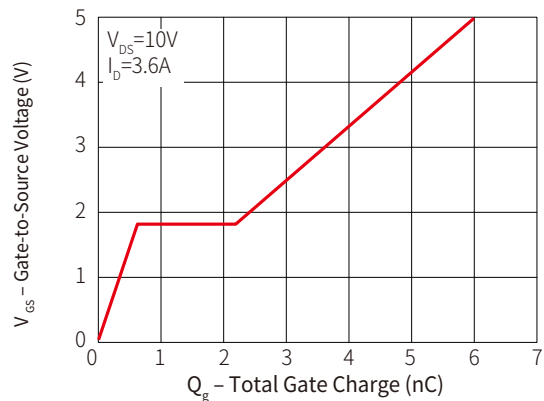


Figure 7: Source-Drain Diode Forward Voltage

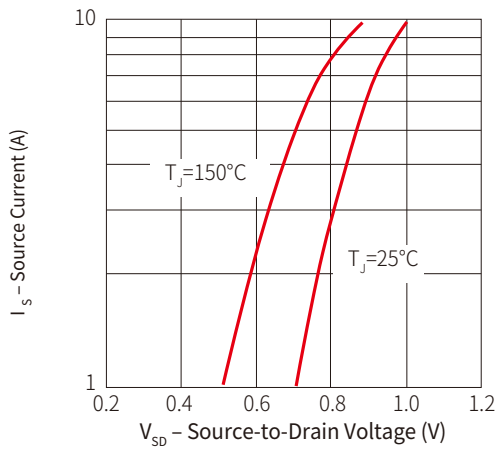


Figure 8: On-Resistance vs. Gate-to-Source Voltage

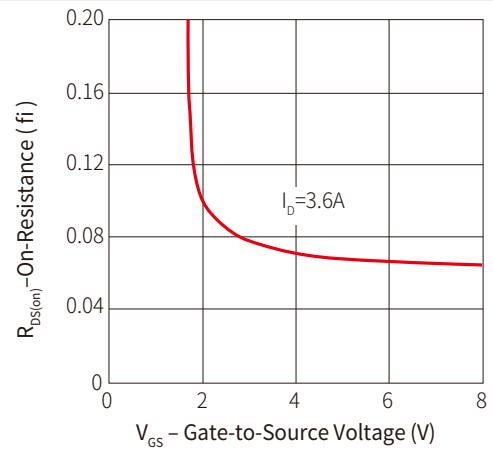


Figure 9: Threshold Voltage

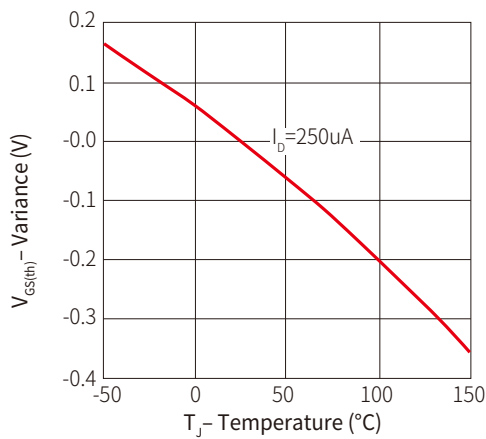


Figure 10: Single Pulse Power

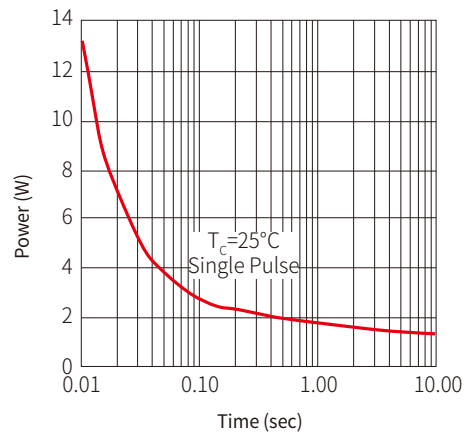


Figure 11: Normalized Thermal Transient Impedance, Junction-to-Ambient

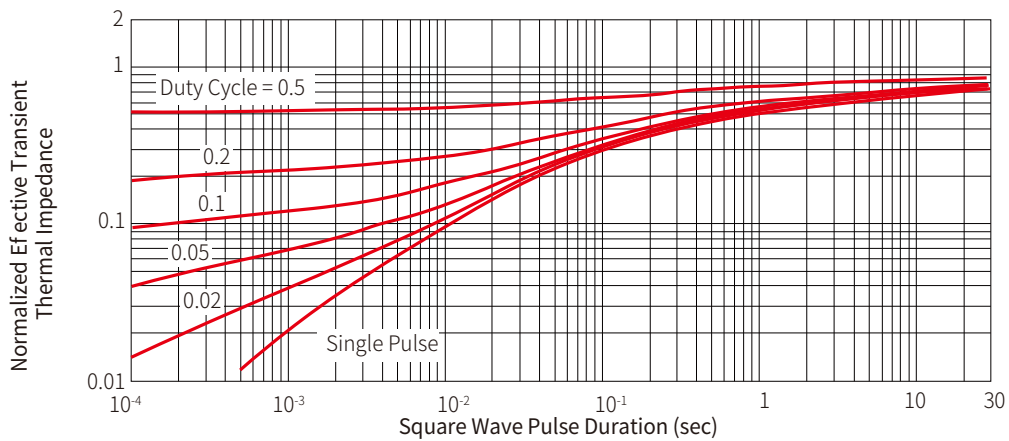
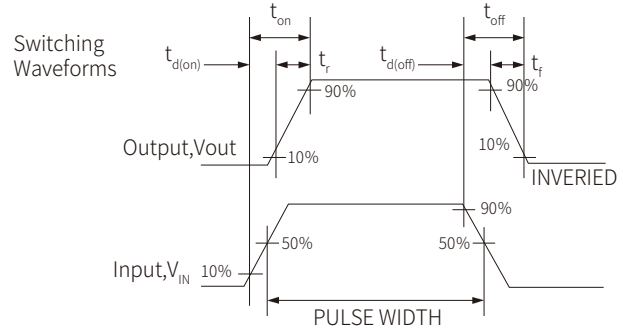
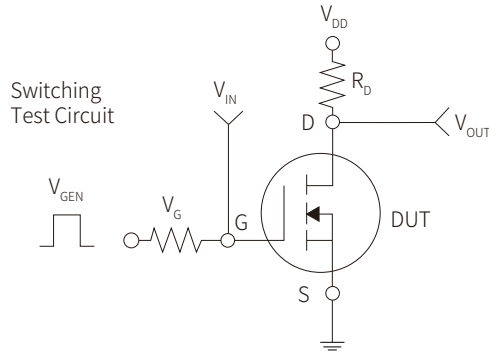
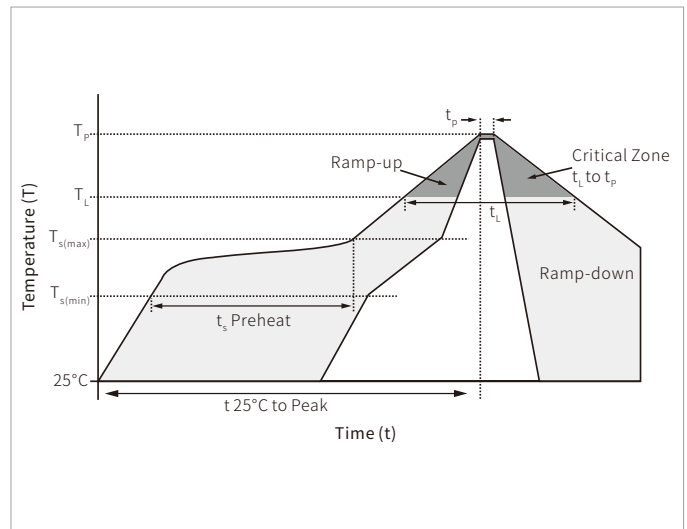


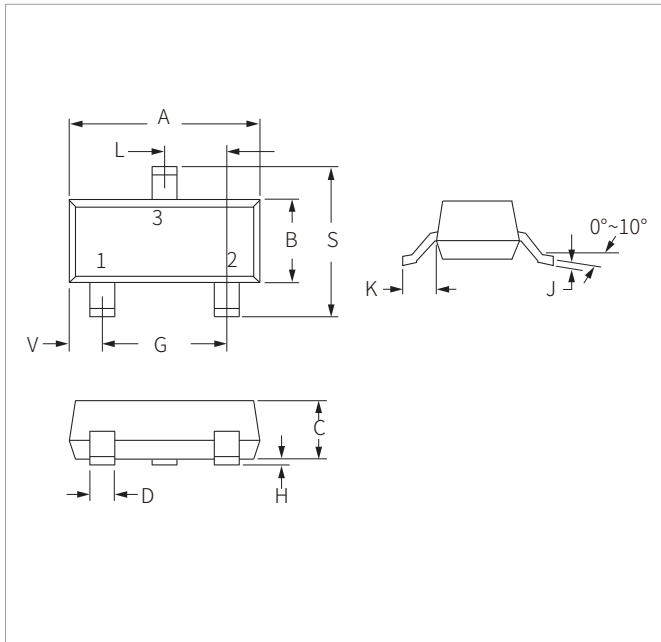
Figure 12: Typical Characteristics


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

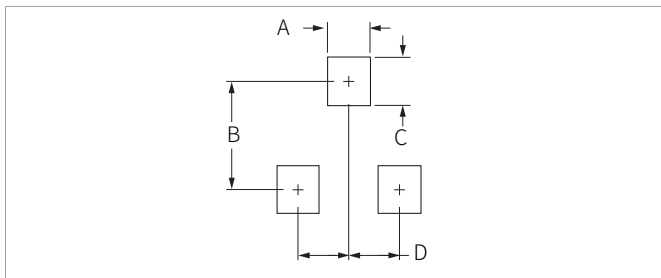


SOT-23 PACKAGE INFORMATION



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.80	3.05	0.110	0.120
B	1.20	1.40	0.047	0.055
C	0.90	1.15	0.035	0.045
D	0.37	0.50	0.015	0.020
G	1.75	2.05	0.069	0.081
H	0.01	0.100	0.001	0.004
J	0.085	0.180	0.003	0.007
K	0.35	0.69	0.014	0.029
L	0.89	1.02	0.035	0.040
S	2.10	2.65	0.083	0.104
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
SNM2300S	SOT-23	3000PCS	7"

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