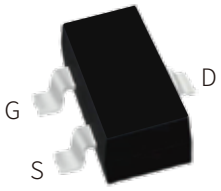
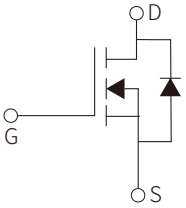
FEATURES

- Ultra low on-resistance:V_{DS}=20V,$R_{DS(ON)}$⩽62mΩ @V_{GS}=4.5V,I_D=3A
- For PWM application
- For Load switch application
- Surface Mount device



SOT-23

Marking



Schematic Symbol

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°C)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	20	V
Drain Current-Continuous	T_A=25°C	I_D	3	A
Drain Current-Continuous	T_A=70°C	I_D	2.5	A
Pulsed Drain Voltage		I_{DM}*	16	A
Gate-Source Voltage		V_{GS}	±8	V
Total Power Dissipation	T_A=25°C	P_D	1.4	W
Total Power Dissipation	T_A=70°C	P_D	0.9	W
Thermal resistance from Junction to ambient		$R_{\theta JA}$	125	°C/W
Junction temperature		T_J	150	°C
Storage temperature		T_{STG}	-55 to 150	°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}=±8V,V_{DS}=0V			±100	nA
Gate Threshold Voltage*	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	0.4	0.7	1	V
Static Drain-Source On–Resistance*	$R_{DS(on)}$	V_{GS}=4.5V,I_D=3A		51	62	mΩ
		V_{GS}=2.5V,I_D=2.8A		58	70	
		V_{GS}=1.8V,I_D=2.5A		68	85	
On-State Drain Current	$I_{D(on)}$	V_{DS}=5V,V_{GS}=4.5V	15			A
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=3A		11		S
Gate resistance	R_g	V_{GS}=0V,V_{DS}=0V,f=1MHz		3	4.5	Ω
Input Capacitance	C_{iss}	V_{DS}=10V,V_{GS}=0V,f=1.0MHz		260	320	pF
Output Capacitance	C_{oss}			48		
Reverse Transfer Capacitance	C_{rss}			27		
Turn–On Delay Time	$t_{d(on)}$	V_{GS}=5V,R_L=3.3Ω V_{DS}=10V,R_{GEN}=6Ω		2.5		ns
Turn–On Rise Time	t_r			3.2		
Turn–Off Delay Time	$t_{d(off)}$			21		
Turn–Off Fall Time	t_f			3		
Diode forward voltage	V_{SD}	I_S=1A,V_{GS}=0V		0.7	1	V
Total Gate Charge	Q_g	V_{GS}=4.5V,V_{DS}=10V,I_D=3A		2.9	3.8	nC
Gate Source Charge	Q_{gs}			0.4		
Gate Drain Charge	Q_{gd}			0.6		
Diode forward current	I_S				2	A
Body Diode Reverse Recovery Time	t_{rr}	I_F=3A,dI/dt=100A/us		14	19	ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F=3A,dI/dt=100A/us		3.8		nC

*Pulse test ; Pulse width ≤300μs, Duty cycle ≤ 0.5%

PARAMETER CHARACTERISTIC CURVE

Fig 1: On-Region Characteristics

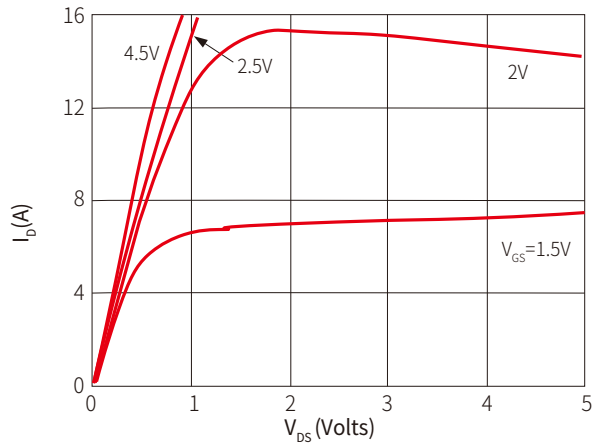


Figure 2: Transfer Characteristics

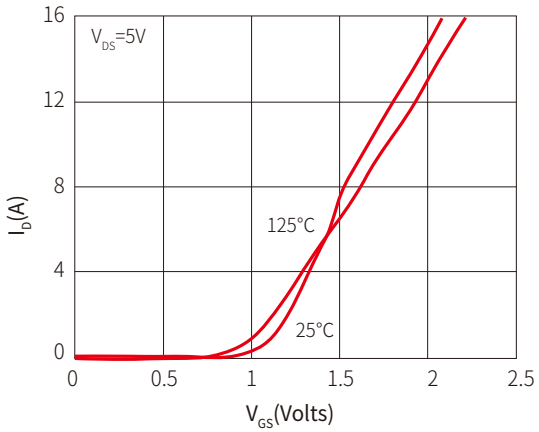


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

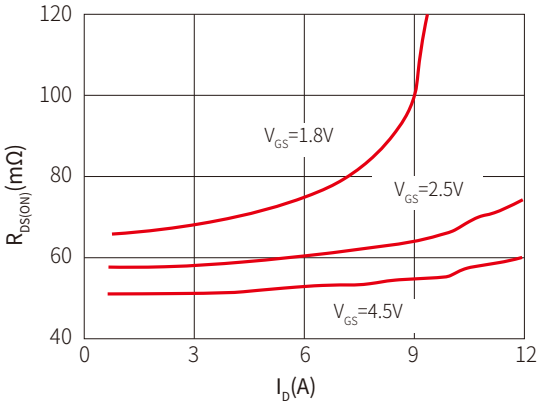


Figure 4: On-Resistance vs. Junction Temperature

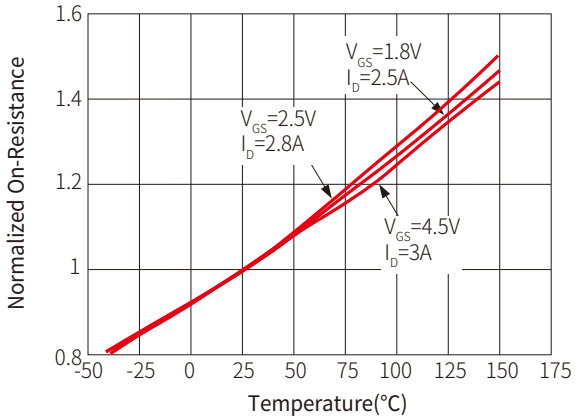


Figure 5: On-Resistance vs. Gate-Source Voltage

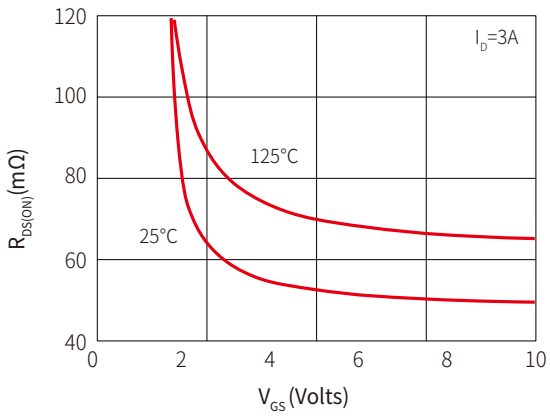


Figure 6: Body-Diode Characteristics

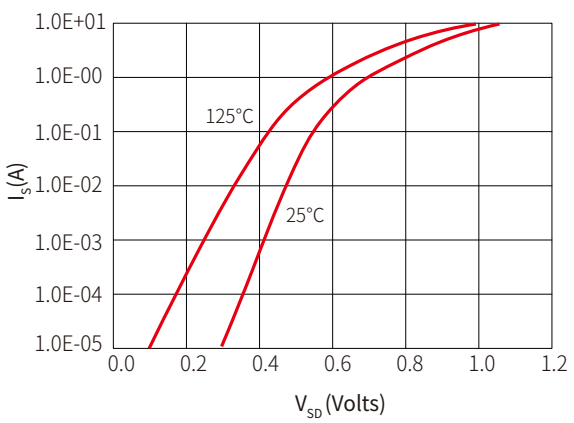


Figure 7: Gate-Charge Characteristics

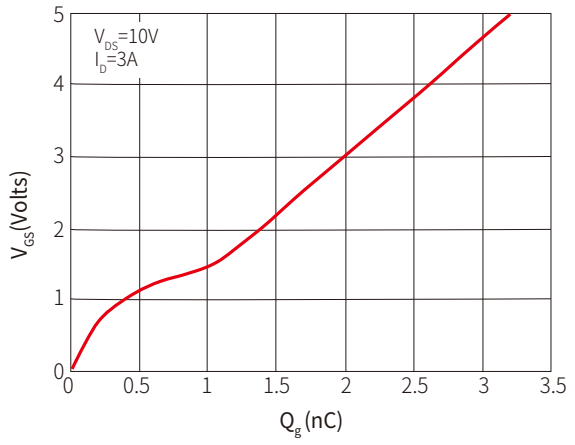


Figure 8: Capacitance Characteristics

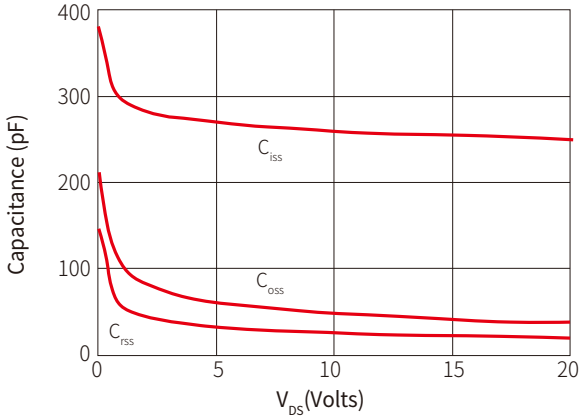


Figure 9: Maximum Forward Biased Safe Operating Are

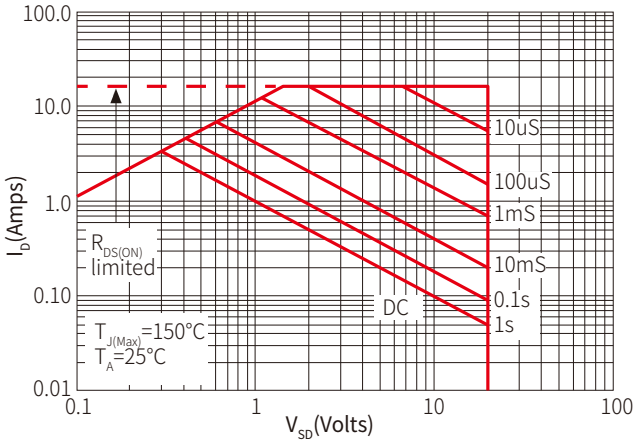


Figure 10: Single Pulse Power Rating Junction-to-Ambient

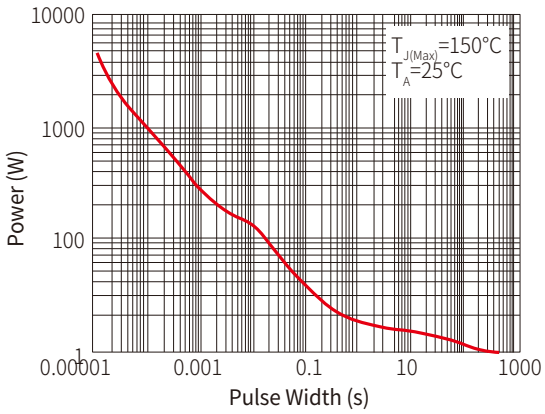


Figure 11: Normalized Maximum Transient Thermal Impedance

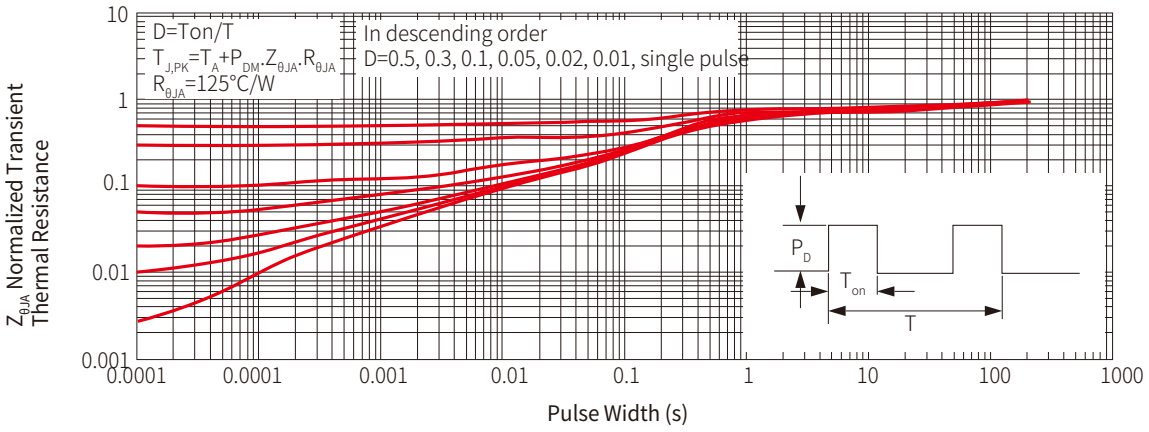


Figure 12: Gate Charge Test Circuit & Waveform

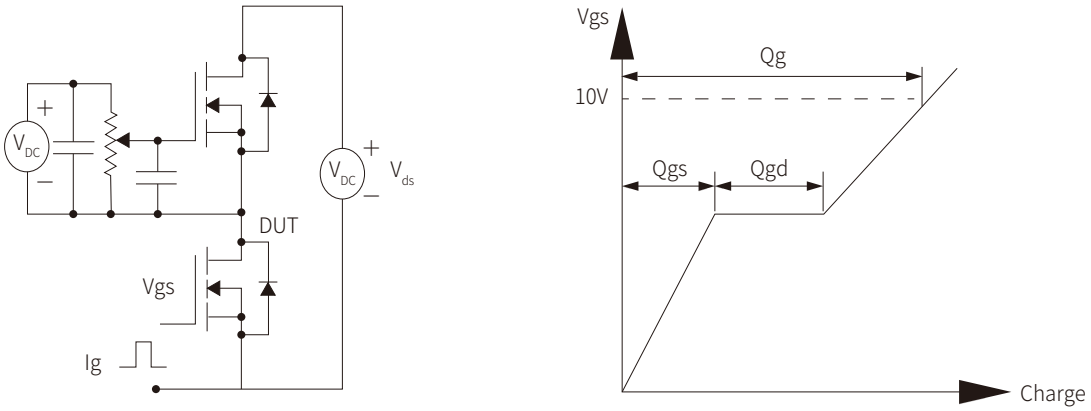


Figure 13: Resistive Switching Test Circuit & Waveforms

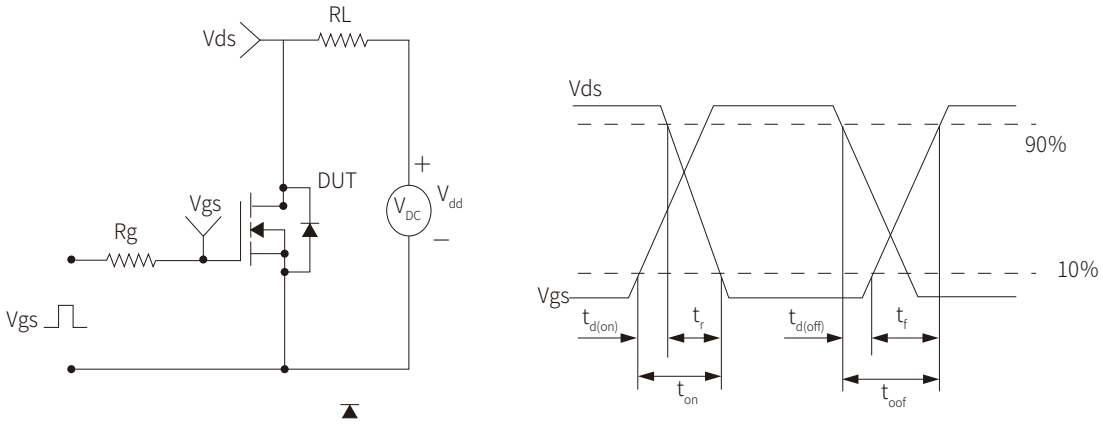


Figure 14: Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

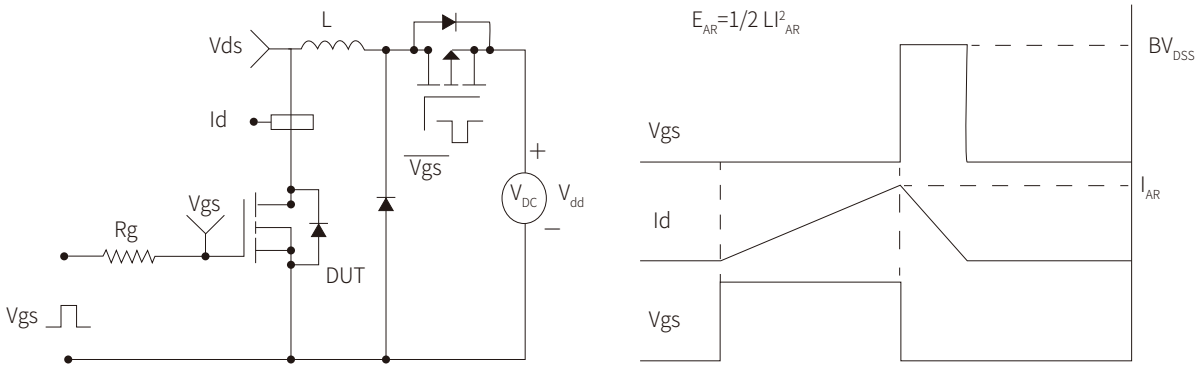
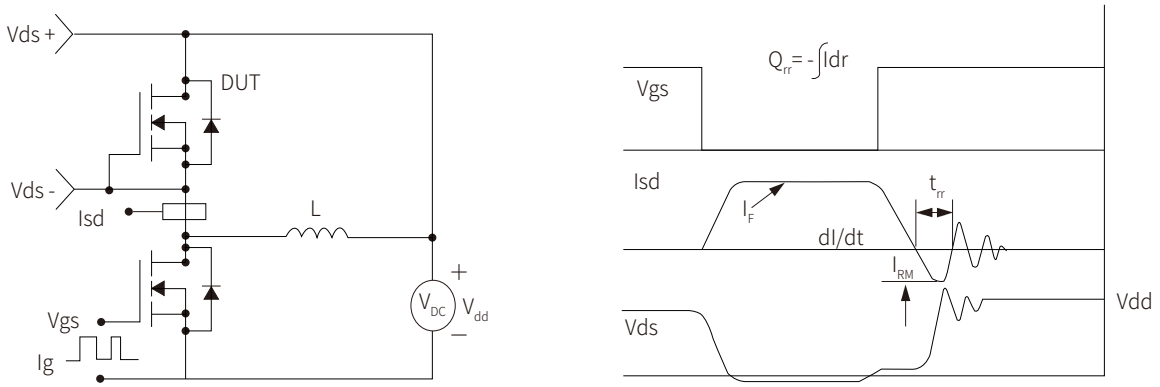
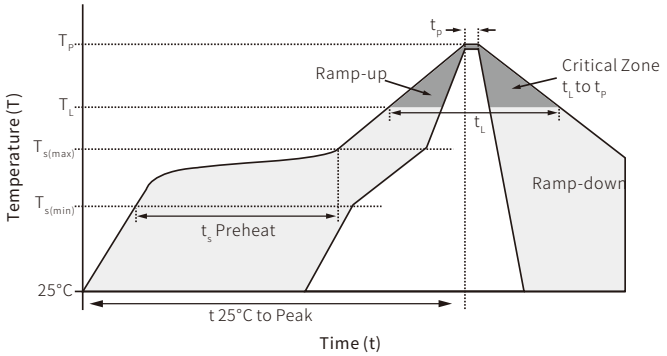


Figure 15: Diode Recovery Test Circuit & Waveforms

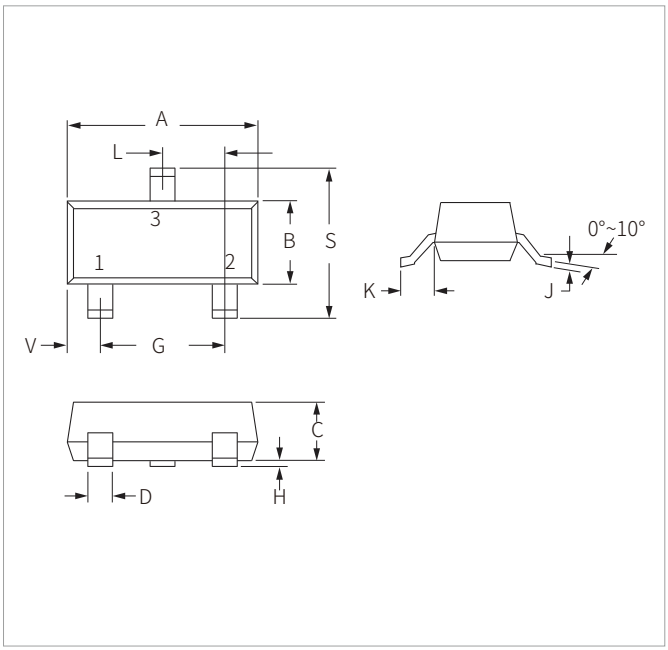


SOLDERING PARAMETERS

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

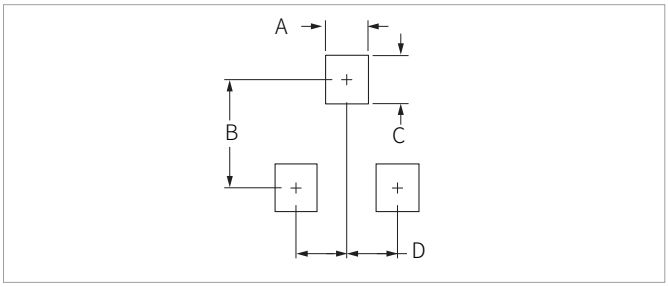


SOT-23 PACKAGE INFORMATION



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
SNM3414S	SOT-23	3000PCS	7”

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Email: fae01@semiware.com

Complaint & Suggestions
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Ext: 8868
Email: cs03@semiware.com

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