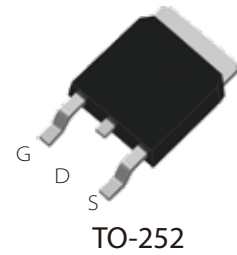


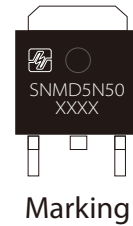
FEATURES

- | Low Gate Charge
- | Low ON Resistance
- | Improved dv/dt Capability
- | 100% Avalanche Tested



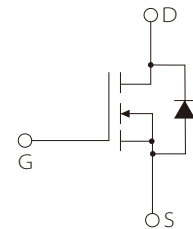
APPLICATION

- | Switching Mode Power Supplies (SMPS)
- | Uninterruptible Power Supply (UPS)
- | Power Factor Correction (PFC) (PFC)
- | Charger



APPROVALS

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



Schematic Symbol

ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

Parameter	Symbol	Value	Unit
Drain-Source Voltage(V _{GS} =0V)	V _{DS}	500	V
Continuous Drain Current ⁽¹⁾	I _D	T _C =25°C	5
		T _C =100°C	3
Drain current pulsed ⁽²⁾	I _{D,pulse}	20	A
Gate-Source Voltage	V _{GS}	±30	V
Single pulsed Avalanche Energy ⁽³⁾	E _{AS}	180	mJ
MOSFET dv/dt Ruggedness, V _{DS} = 0...480V	dv/dt	5	V/ns
Total power dissipation (@T _C =25°C)	P _D	48.3	W
Continuous Diode Forward Current	I _S	5	A
Diode Pulsed Current ⁽²⁾	I _{S,pulse}	20	A
Operating Junction Temperature & Storage Temperature	T _{STG} , T _J	-55 to +150	°C
Thermal Resistance, Junction-to-Case	R _{thJC}	2.59	°C/W
Thermal Resistance, Junction-to-Ambient	R _{thJA}	62	°C/W

Notes

1. Limited by maximum junction temperature.
2. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. L=10mH, I_D=5A, Start T_J=25°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Static Characteristics							
Drain-source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	500			V	
Zero Gate Voltage Drain current	I _{DSS}	V _{DS} =500V, V _{GS} =0V, T _J =25°C			1	μA	
		V _{DS} =500V, V _{GS} =0V, T _J =150°C			100	μA	
Gate Leakage Current	I _{GSS}	V _{GS} =±30V			±100	nA	
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2		4	V	
Drain-Source On-State-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =2.5A		1.2	1.5	Ω	
Gate Resistance	R _G	f = 1.0MHz open drain		2.5		Ω	
Dynamic Characteristics							
Input capacitance	C _{ISS}	V _{DS} = 25V, V _{GS} = 0V, f=1MHz		488		pF	
Output capacitance	C _{OSS}				60		pF
Reverse Transfer capacitance	C _{rss}				7.2		pF
Turn-on Delay Time	td(on)	V _{DD} =250V, I _D =5A, R _G =10Ω V _{GS} =10V		14		ns	
Rising time	tf				18		ns
Turn-off Delay Time	td(off)				32		ns
Input capacitance	tf				11		ns
Total gate charge	Q _g	V _{DD} =400V, I _D =5A, V _{GS} =10V		16.5		nC	
Gate-source charge	Q _{gs}				3.8		nC
Gate-drain charge	Q _{gd}				5.6		nC
Gate Plateau Voltage	V _{Plateau}				4.6		V
Drain-Source Body Diode Characteristics							
Diode forward voltage drop.	V _{SD}	I _{SD} =5A, V _{GS} =0V, T _J = 25°C			1.2	V	
Reverse recovery time	T _{rr}	V _R =400V, I _F =5A, di _F /dt=100A/μs		328		ns	
Reverse recovery Charge	Q _{rr}				1.6		μC

CHARACTERISTIC CURVES

Fig.1 Transient Thermal Impedance

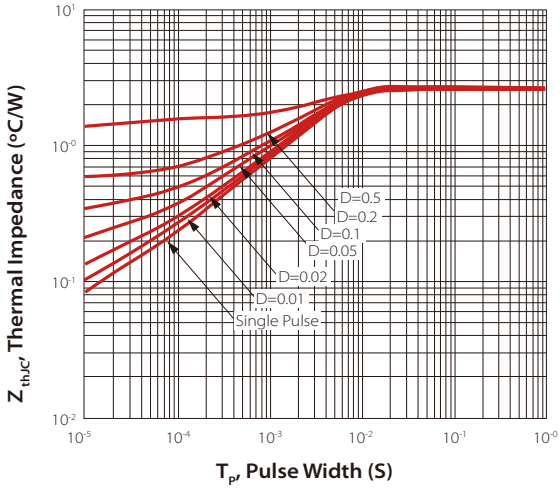


Fig.2 Transient Thermal Impedance

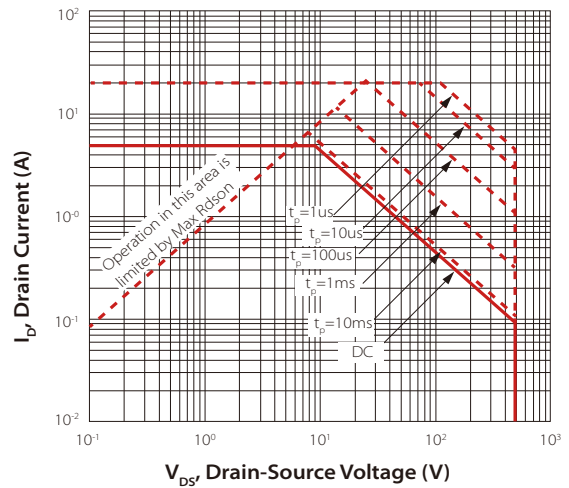


Fig.3 Transfer Characteristics

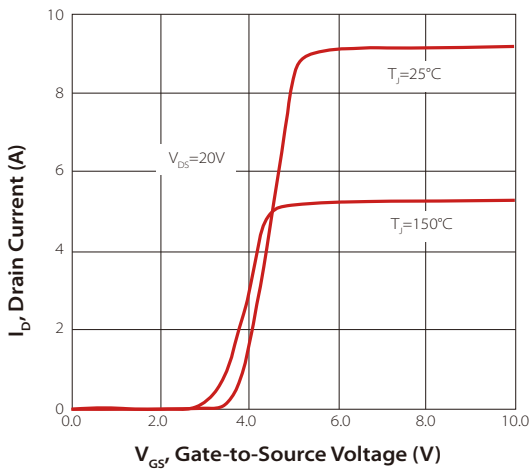


Fig.4 Capacitance Characteristics

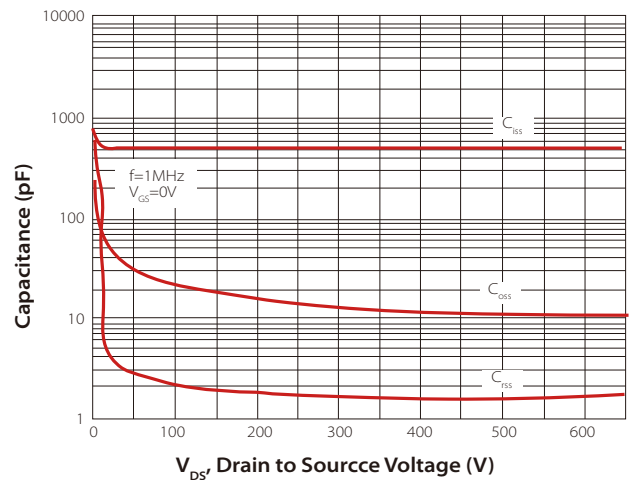


Fig.5 On-Resistance vs Drain Current

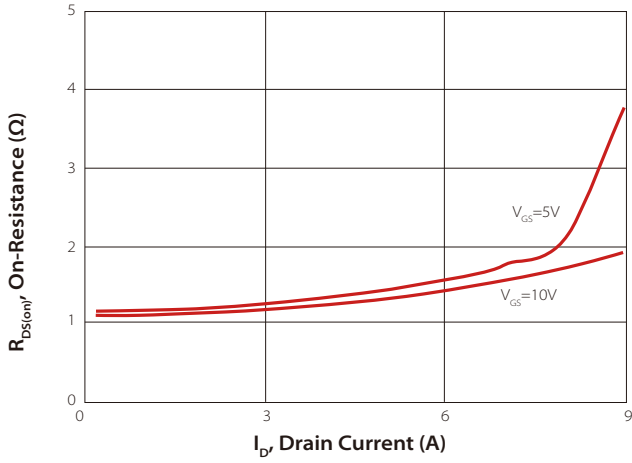


Fig. 6 Capacitance

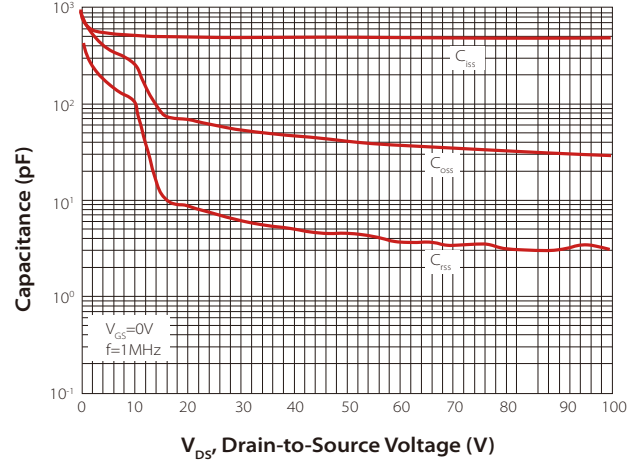


Fig.7 Gate Charge

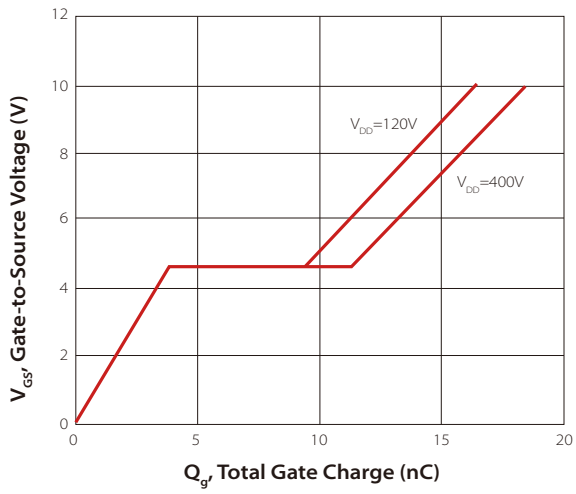


Fig.8 Body Diode Forward Voltage

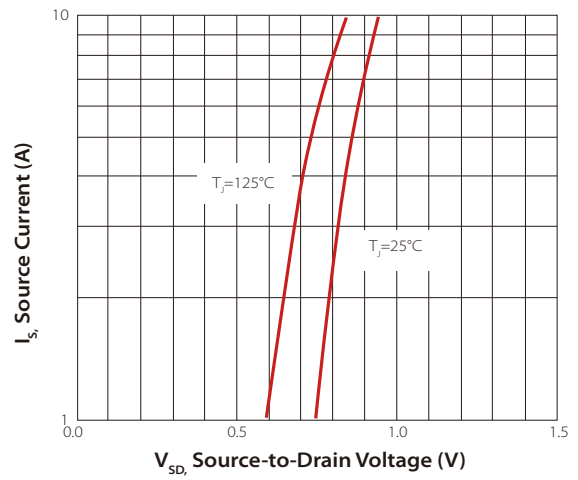


Fig.9 Breakdown Voltage vs Junction Temperature

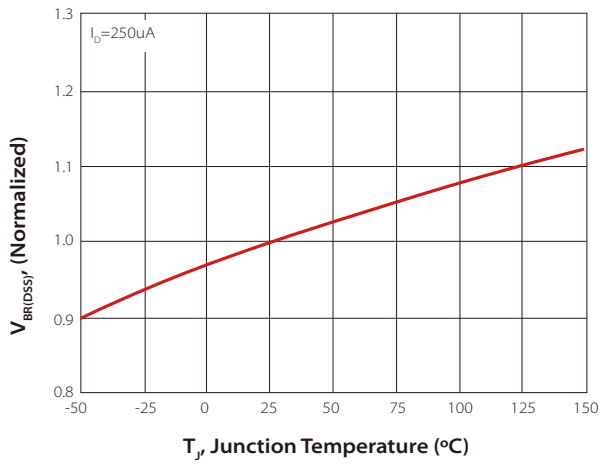


Fig. 10 On-Resistance vs Temperature

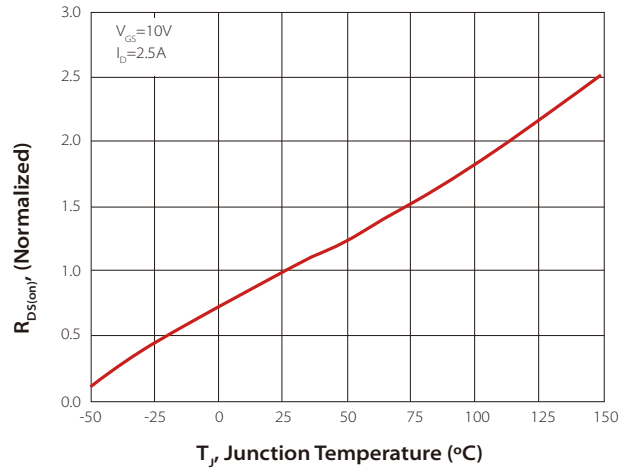


Fig.11 Gate Charge Test Circuit and Waveform

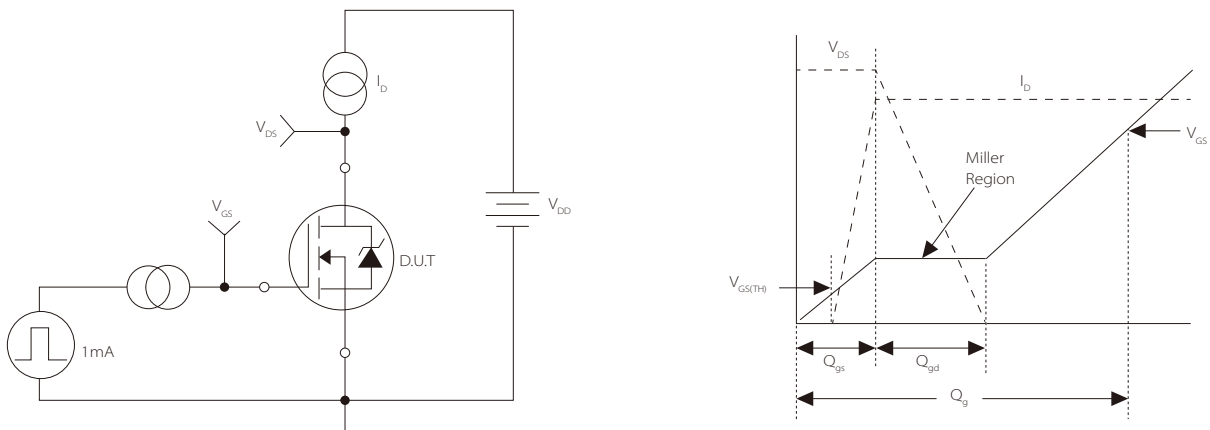


Fig.12 Resistive Switching Test Circuit and Waveform

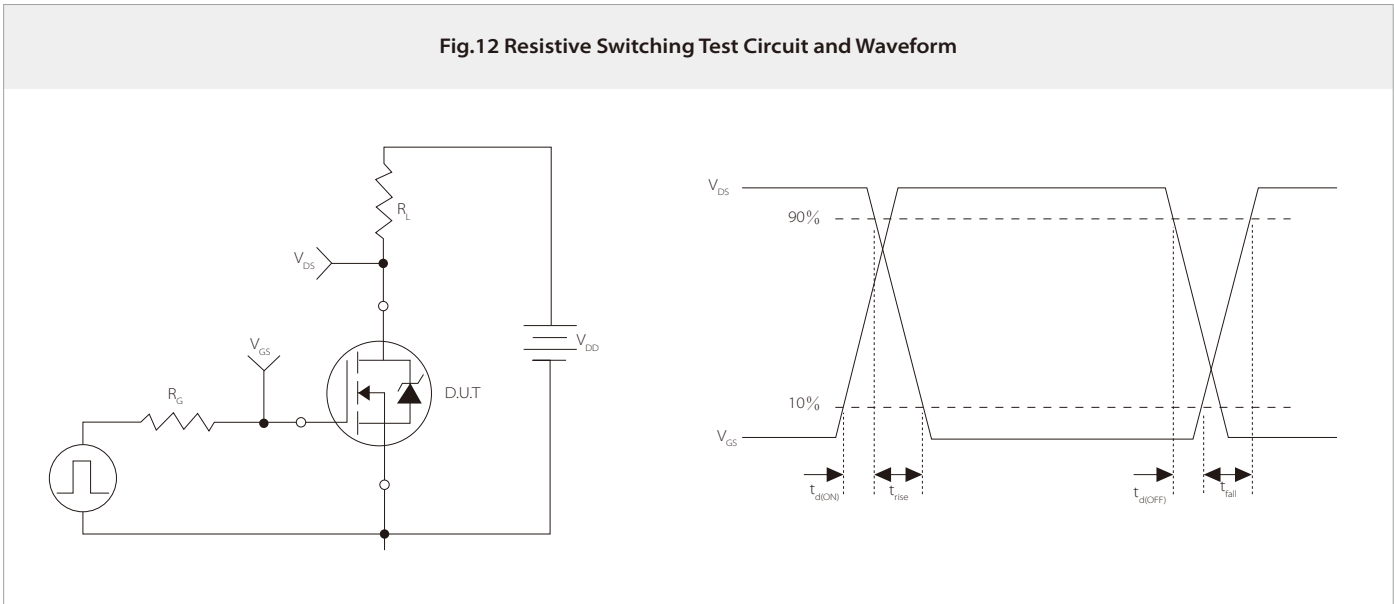
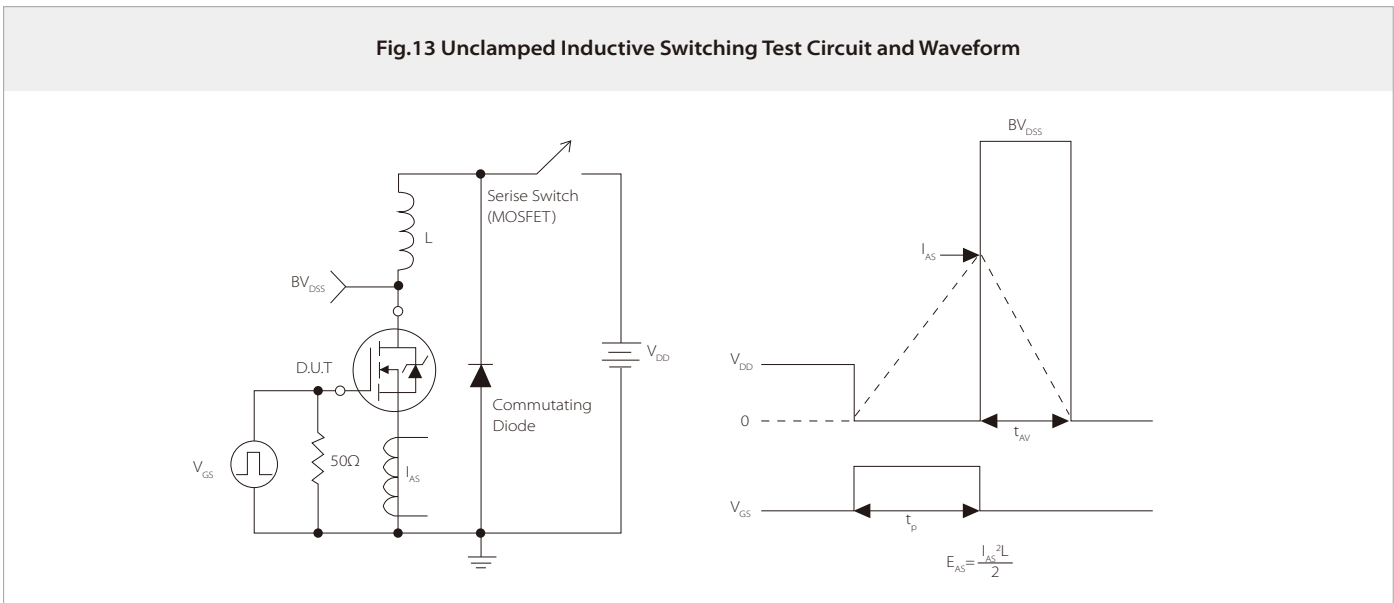
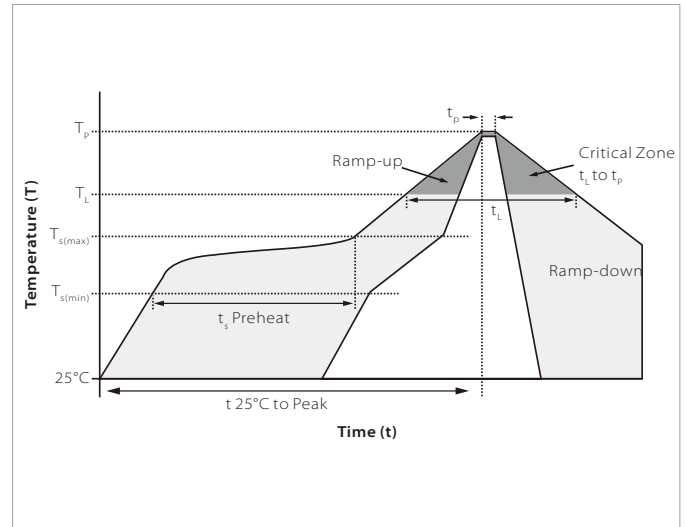


Fig.13 Unclamped Inductive Switching Test Circuit and Waveform

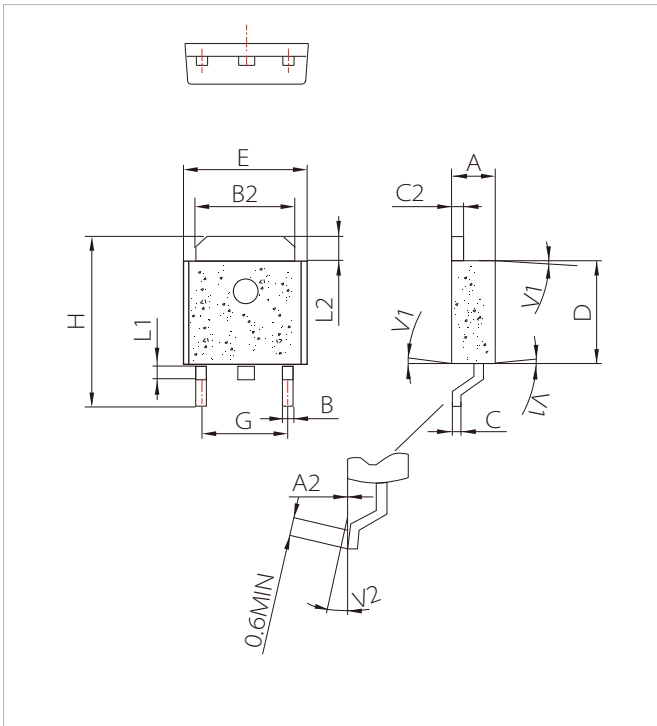


SOLDERING PARAMETERS

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_r)	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



TO-252 PACKAGE MECHANICAL DATA



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.20		2.40	0.086		0.095
A2	0.03		0.23	0.001		0.009
B	0.55		0.65	0.022		0.026
B2	5.10		5.40	0.200		0.213
C	0.45		0.62	0.018		0.024
C2	0.48		0.62	0.019		0.024
D	6.00		6.20	0.236		0.244
E	6.40		6.70	0.252		0.264
G	4.40		4.70	0.173	0.1	0.185
H	9.35		10.6	0.368		0.417
L1	1.30		1.70	0.051	0.143	0.067
L2	1.37		1.50	0.054		0.059
L1		4°			0.130	
V2	0°		8°	0°		8°

ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SNMD5N50	TO-252	5000PCS	13"

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