

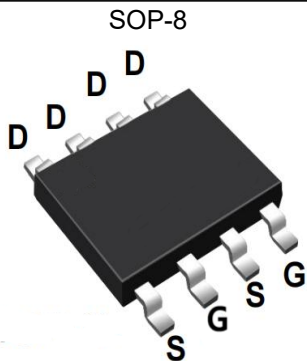


1. Features

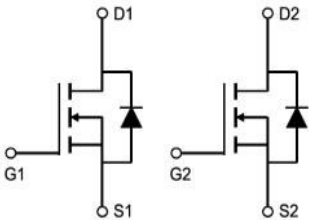
- Advanced trench cell design
- Low Thermal Resistance
- Low Gate Charge

2. Mechanical Data

- Case:Molded Plastic,SOP-8 .
- Epoxy:UL 94V-0 rate flame retardant
- Terminals:Plated Leads Solderable perMIL-STD-750,Method-2026.
- Marking:XNM10N03ST
- Mounting Position : Any.



- 1 Gate
2 Source
3 Drain



3. Maximum Ratings and Electrical Characteristics

Rating at 25°C ambient temperature unless otherwise specified.

Parameter		Symbol	Value	UNIT
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	$T_A = 25^{\circ}\text{C}$	I_D	10	A
	$T_A = 70^{\circ}\text{C}$		8	
Drain Current-Pulsed ¹		I_{DM}	55	A
Avalanche Current		I_{AS}	22	A
Single Pulse Avalanche Energy ¹		E_{AS}	24	mJ
Power Dissipation		P_{tot}	2	W
Thermal Resistance from Junction to Lead		$R_{\theta JL}$	40	°C/W
Thermal Resistance from Junction to Ambient ²		$R_{\theta JA}$	62.5	°C/W
Junction and Storage Temperature Range		T_J, T_{STG}	-55~ +150	°C

**4. Electrical Characteristics**

Rating at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-source breakdown voltage	V _{(BR) DSS}	V _{GS} = 0V, I _D =250μA	30			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =30V			1	μA
Gate-source leakage current	I _{GSS}	V _{GS} =±20V			±100	nA
On characteristics ³						
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =10A		10.8	13	mΩ
		V _{GS} =4.5V, I _D =5A		14	17.5	mΩ
Forward tranconductance	g _{FS}	V _{DS} =5V, I _D =10A		43		S
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1		2.5	V
Dynamic Characteristics ⁴						
Gate resistance	R _g	V _{DS} = 0 V, V _{GS} =0V,f = 1 MHz			2.4	Ω
Input capacitance	C _{iss}	V _{DS} =15V,V _{GS} =0V,f =1MHz		760		pF
Output capacitance	C _{oss}			125		pF
Reverse transfer capacitance	C _{rss}			70		pF
Switching Characteristics ⁴						
Gate charge total	Q _g	V _{DS} = 15 V, I _D = 10 A, V _{GS} = 4.5 V		6.6		nC
				14		
Gate-Source Charge	Q _{gs}	V _{DS} =15V,I _D =10A,V _{GS} =10V		2.4		nC
Gate-Drain Charge	Q _{gd}			3		nC
Turn-on delay time	t _{d(on)}	V _{GS} = 10 V, V _{DS} = 15V, R _L = 1.5 Ω, R _{GEN} = 3 Ω		4.4		nS
Turn-on rise time	t _r			9		nS
Turn-off delay time	t _{d(off)}			17		nS
Turn-off fall time	t _f			6		nS
Source-Drain Diode characteristics ⁴						
Body Diode Voltage	V _{SD}	I _S =1A,V _{GS} =0V			1	V
Body Diode Reverse Recovery Time	t _{rr}	I _F =10A, di/dt = 100 A / μs		7		nS
Body Diode Reverse Recovery Charge	Q _{rr}	I _F =10A, di/dt = 100 A / μs		8		nC

Notes :

1.Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^\circ C$. Ratings are based on low frequency and duty cycles to keep initial $T_J = 25^\circ C$

2.The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ C$

The value in any given application depends on the user's specific board design.



5. Rating And Characteristic Curves

Fig1: n-Region Characteristics

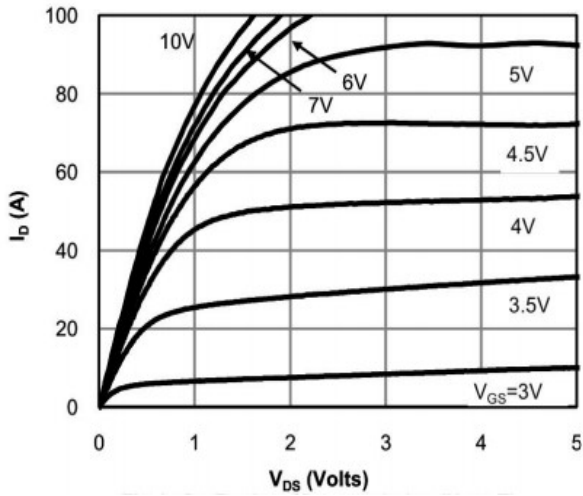


Fig2: Transfer Characteristics

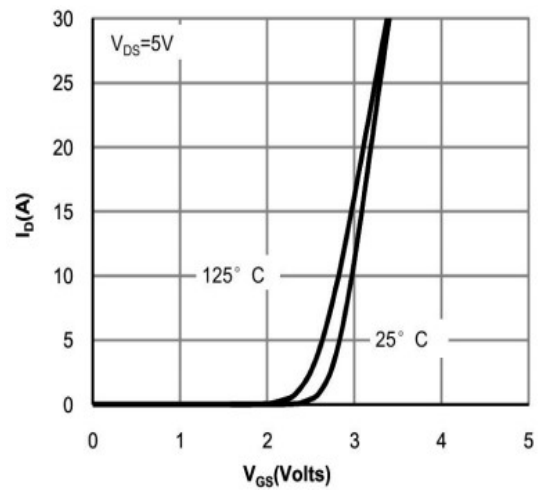


Fig.3 $R_{DS(on)}$ - I_D

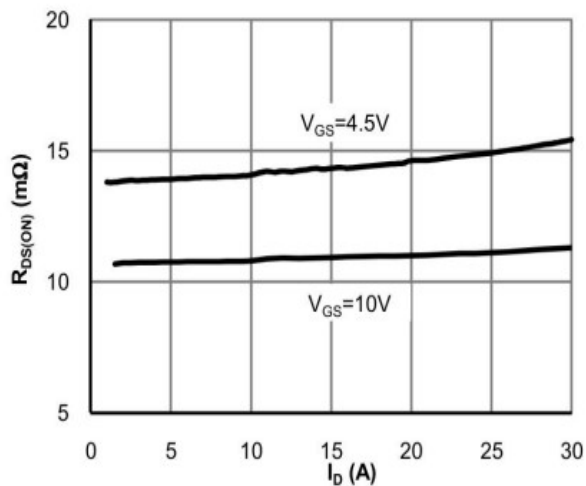


Fig.4 On-Resistance vs. Junction Temperature

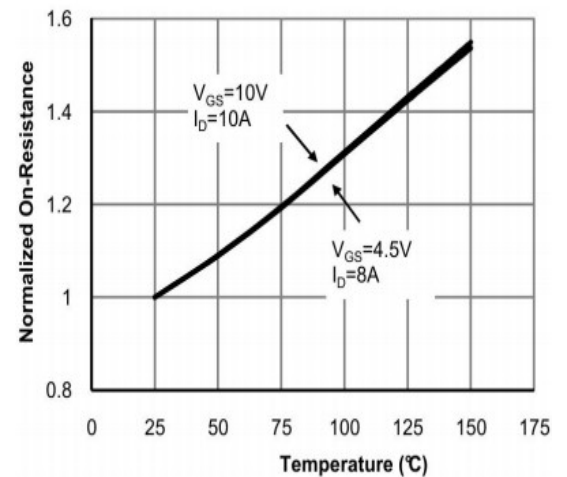


Fig.5 On-Resistance vs. Gate-Source Voltage

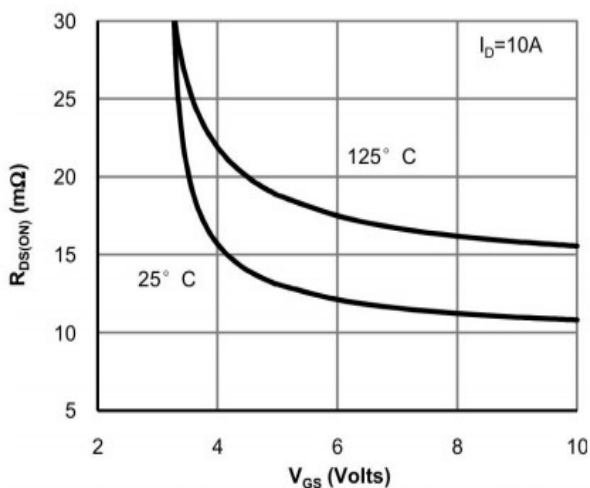
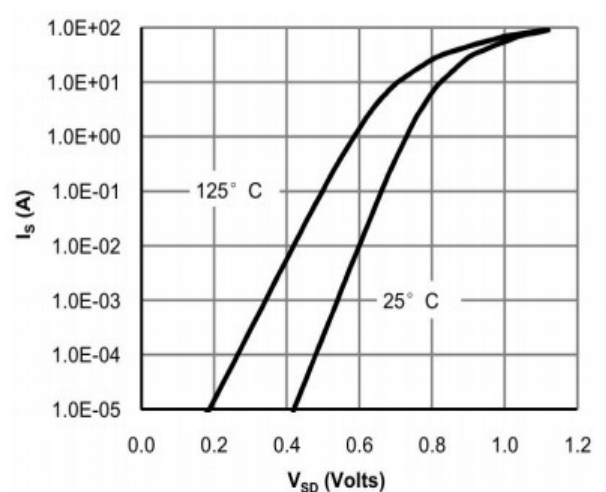


Fig.6 Body-Diode Characteristics





5. Rating And Characteristic Curves

Fig7: Gate-Charge Characteristics

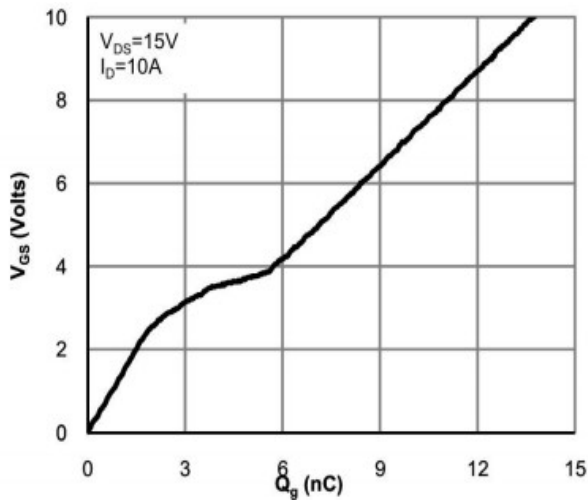


Fig8: Capacitance Characteristics

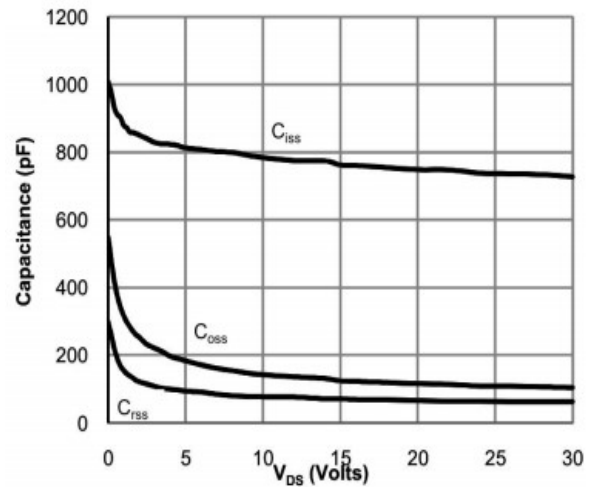


Fig.9 Single Pulse Avalanche capability

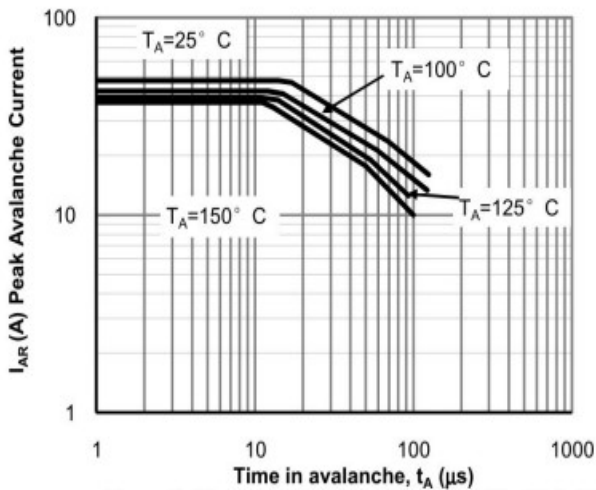


Fig.10 Maximum Forward Biased Safe Operating Area

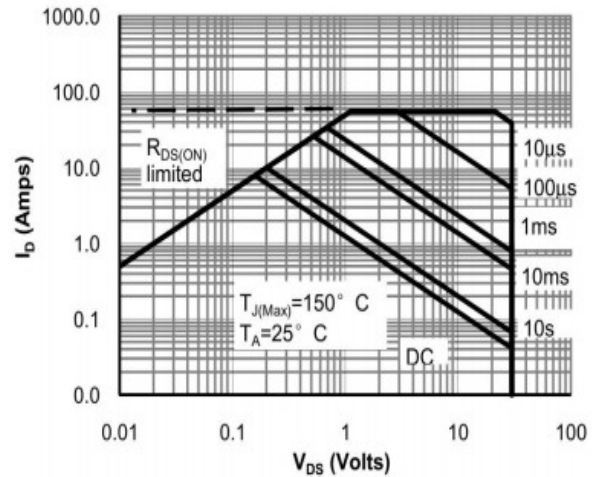
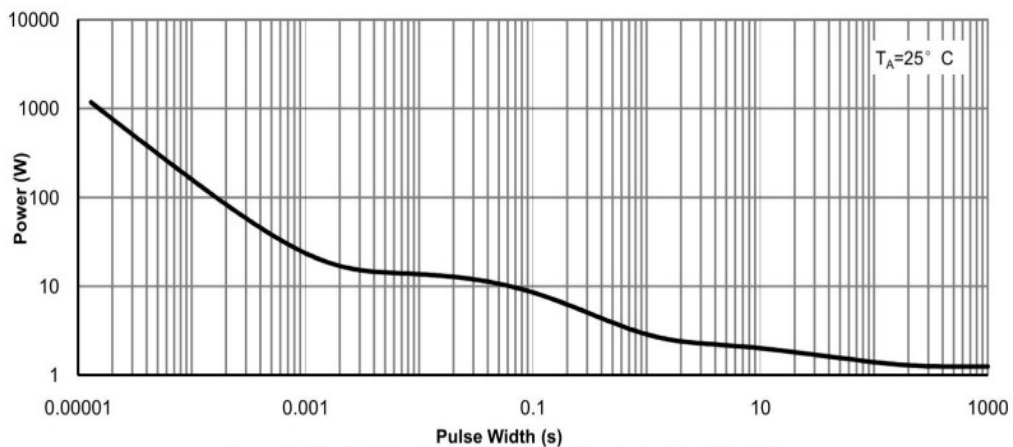
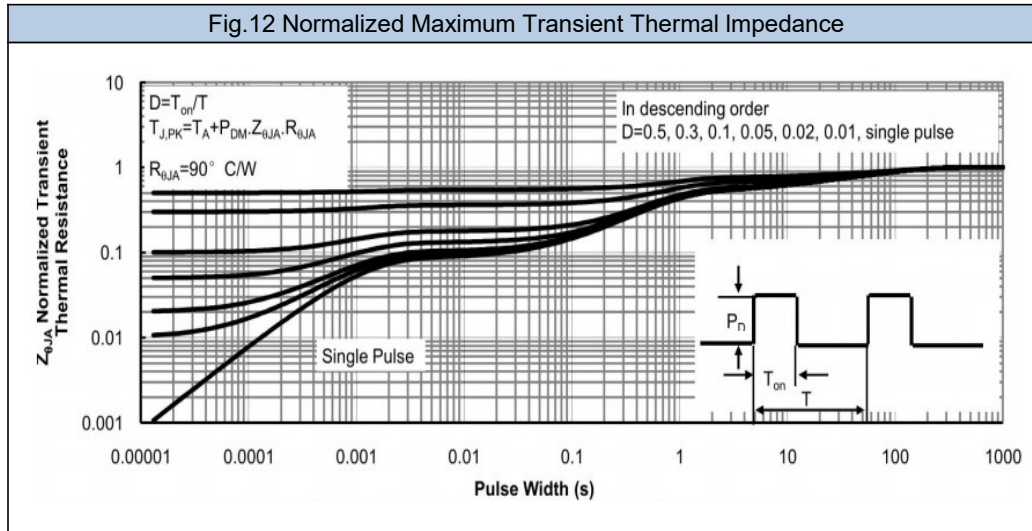


Fig.11 Single Pulse Power Rating Junction-to-Ambient



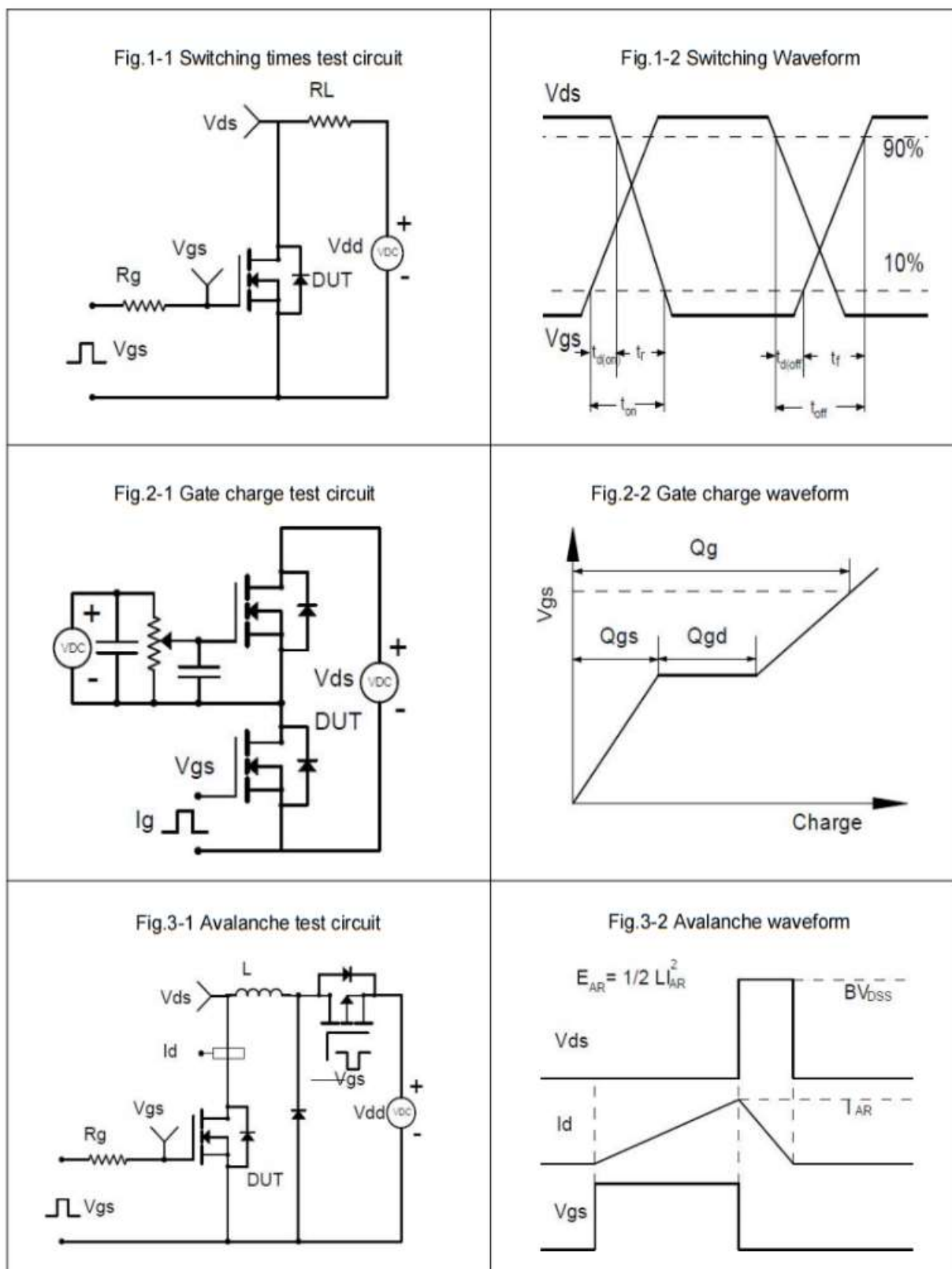


5. Rating And Characteristic Curves



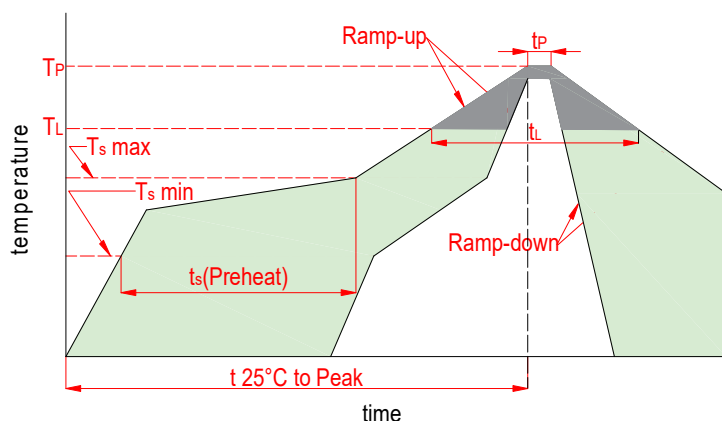


6. Test Circuits



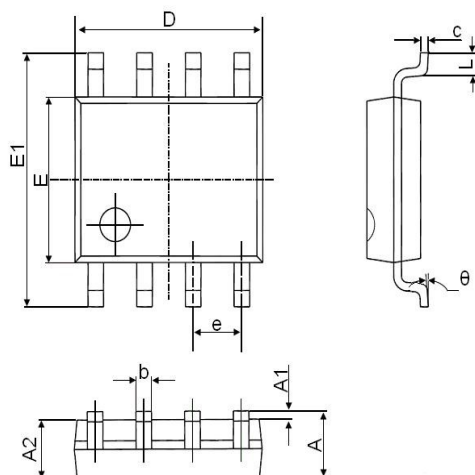


7. Soldering Parameters



Reflow Condition		Lead-free
Pre Heat	Temp. min(T_s (min))	150℃
	Temp. max(T_s (min))	200℃
	Time(min to max)(t_s)	60~180s
Aver. ramp up rate(Liquidus Temp.)(T_L)to peak		3℃/s max
T_s (max) to T_L -Ramp-up Rate		3℃/s max
Reflow	Temp.(T_L)(Liquidus)	217℃
	Temp.(t_L)(Liquidus)	60~150s
Peak Temp.(T_P)		260 ^{+0/-5} ℃
Time within actual peak Temp.(t_p)		30s max
Ramp-down Rate		6℃/s max
Time 25℃ to peak Tempe.(T_P)		8 minutes max
Do not exceed		260℃

8. Dimensions



Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.053	0.069	1.350	1.750
A1	0.004	0.010	0.100	0.250
A2	0.053	0.061	1.350	1.550
b	0.012	0.020	0.300	0.510
c	0.007	0.009	0.170	0.230
D	0.185	0.201	4.700	5.100
E	0.150	0.161	3.800	4.100
E1	0.228	0.244	5.800	6.200
e	0.050(BSC)		1.270(BSC)	
L	0.016	0.031	0.400	0.800
θ	0°	8°	0°	8°

9. Package Information

Package	Part Number	Marking Code
SOP-8	XNM10N03ST	XNM10N03ST



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