



XNM85N10DF

100V N-Channel MOSFET

1. Features

- V_{DS} 100V
- I_D 85A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) 4.6m Ω (Typ)

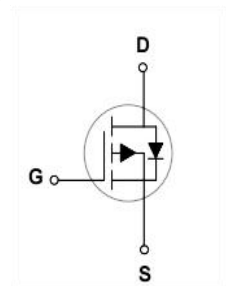
2. Mechanical Data

- Case:Molded Plastic,PDFN5*6 .
- Epoxy:UL 94V-0 rate flame retardant
- Terminals:Plated Leads Solderable perMIL-STD-750,Method-2026.
- Marking:85N10
- Mounting Position : Any.

PDFN5*6



- 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}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	$T_C = 25^\circ\text{C}$	I_D	85	A
	$T_C = 100^\circ\text{C}$		67	
Drain Current-Pulsed ¹		I_{DM}	220	A
Avalanche Current		I_{AS}	50	A
Single Pulse Avalanche Energy ²⁾		E_{AS}	125	mJ
Power Dissipation		P_{tot}	156	W
Thermal Resistance from Junction to Case ³⁾		$R_{\theta JC}$	0.8	°C/W
Thermal Resistance from Junction to Ambient ³⁾		$R_{\theta JA}$	55	°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	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	100			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 100V, V_{GS} = 0V$			1	μA
Gate-source leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
On characteristics						
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$		4.6	6	m Ω
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	2	3	4	V
Dynamic Characteristics						
Gate resistance	R_g	$V_{DS} = 0V, f = 1MHz$			1.5	Ω
Forward Transconductance	g_{fs}	$V_{DS} = 5V, I_D = 20A$		60		S
Input capacitance	C_{iss}	$V_{DS} = 15V, V_{GS} = 0V, f = 1MHz$		3830		pF
Output capacitance	C_{oss}			327		pF
Reverse transfer capacitance	C_{rss}			16.5		pF
Switching Characteristics						
Gate charge total	Q_g	$V_{DS} = 50V, I_D = 30A, V_{GS} = 4.5V$		15.5		nC
				45		
Gate-Source Charge	Q_{gs}	$V_{DS} = 50V, I_D = 20A, V_{GS} = 10V$		16		nC
Gate-Drain Charge	Q_{gd}			7		nC
Turn-on delay time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 50V,$ $R_L = 2.5\Omega, R_{GEN} = 3\Omega$		13		nS
Turn-on rise time	t_r			4		nS
Turn-off delay time	$t_{d(off)}$			26		nS
Turn-off fall time	t_f			4.5		nS
Source-Drain Diode characteristics						
Body Diode Voltage	V_{SD}	$I_S = 1A, V_{GS} = 0V$		0.7	1	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 20A, di/dt = 500A/\mu s$		19		nS
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F = 20A, di/dt = 500A/\mu s$		225		nC

Notes :

- 1) Pulse Test: Pulse Width $\leq 100\mu s$, Duty Cycle $\leq 2\%$, Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^\circ C$.
- 2) Limited by $T_{J(MAX)}$, starting $T_J = 25^\circ C$, $L = 0.1mH$, $R_g = 25\Omega$, $I_D = 50A$, $V_G = 10V$.
- 3) Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air.



5. Rating And Characteristic Curves

Fig1: On-Region Characteristics

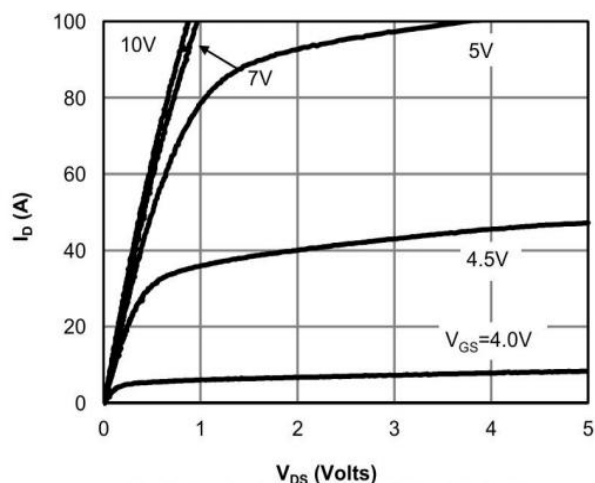


Fig2: Transfer Characteristics

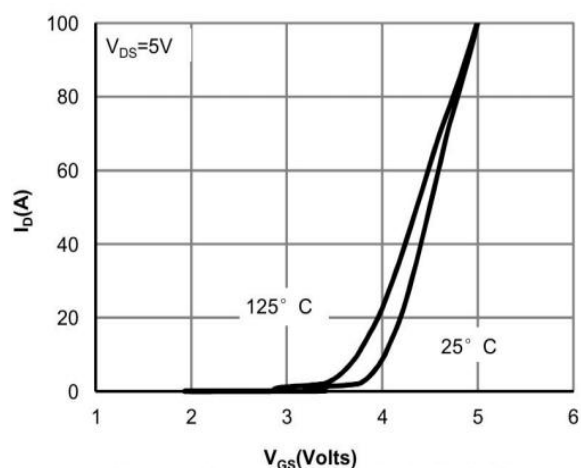


Fig.3 On-Resistance vs.Drain Current and Gate Voltage

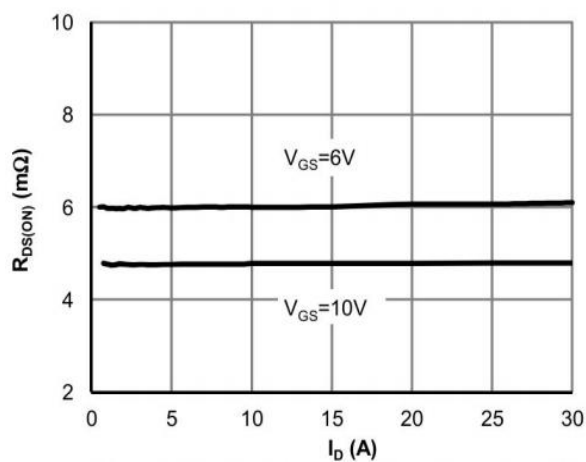


Fig.4 On-Resistance vs.Junction Temperature

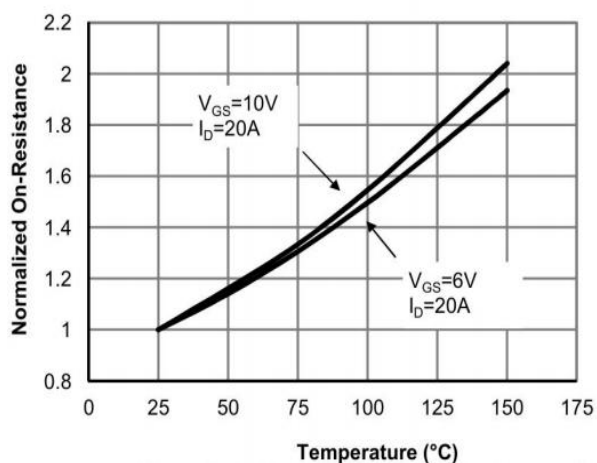


Fig.5 Normalized Transient Impedance

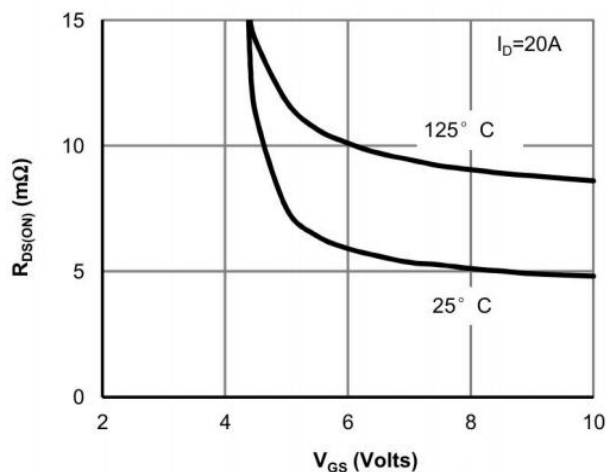
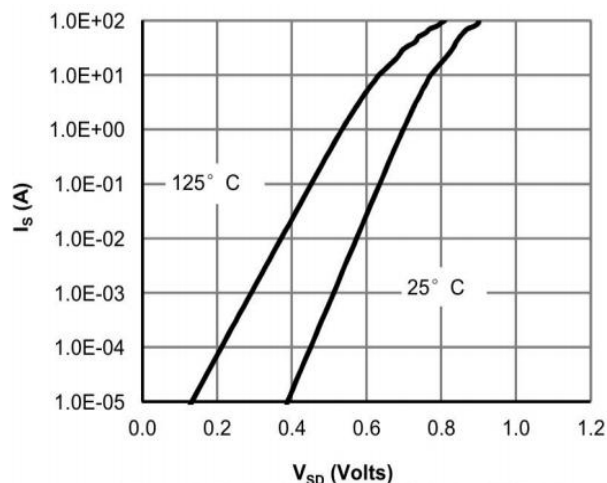


Fig.6 Body-Diode Characteristics





5. Rating And Characteristic Curves

Fig 7: Gate-Charge Characteristics

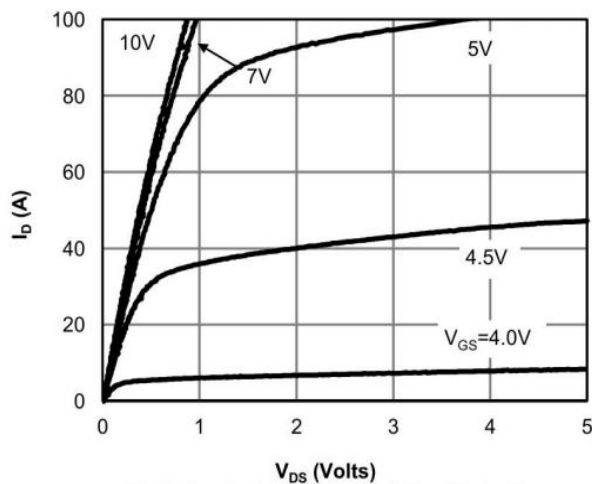


Fig8: Capacitance Characteristics

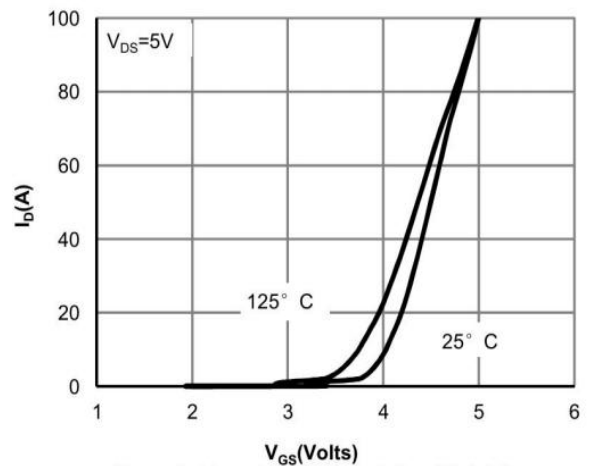


Fig.9 Maximum Forward Biased Safe Operating Area

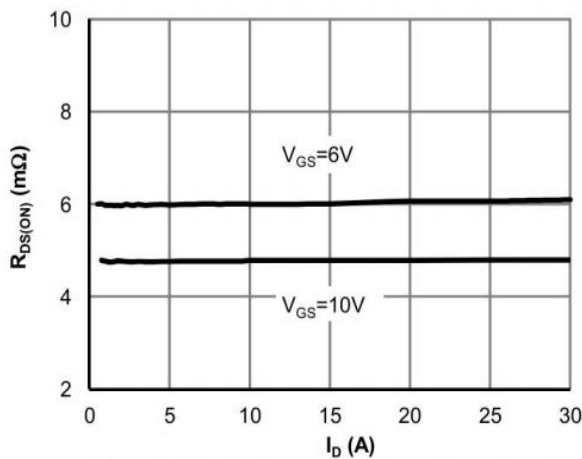


Fig.10 On-Resistance vs.Junction Temperature

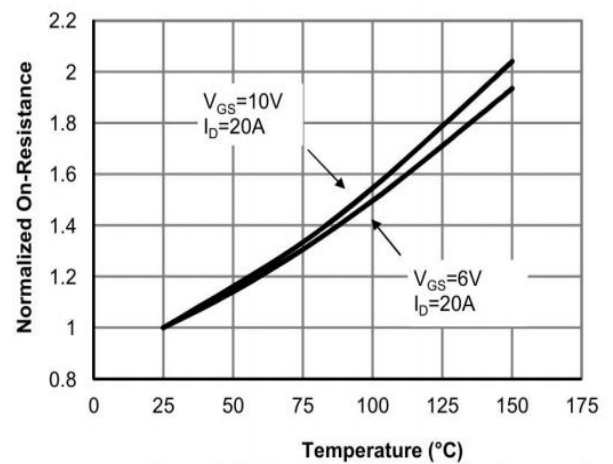


Fig.11 Normalized Maximum Transient Thermal Impedance

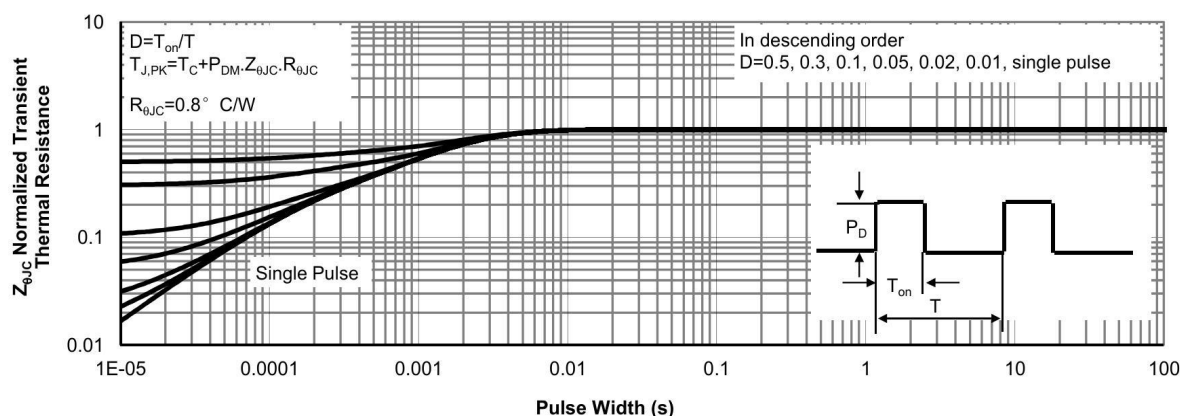


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)



5. Rating And Characteristic Curves

Fig12: Single Pulse Avalanche capability

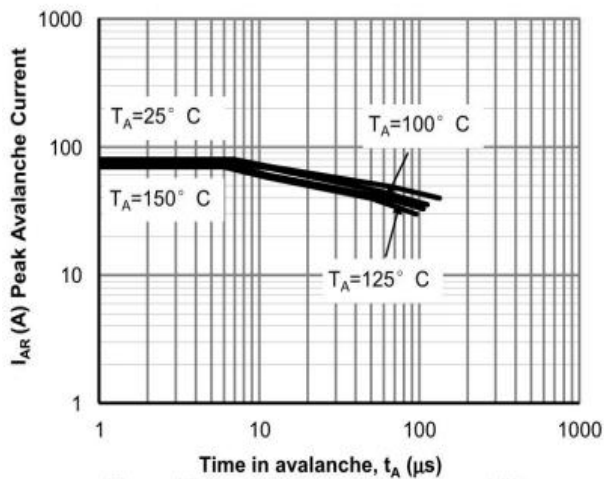


Fig13: Power De-rating

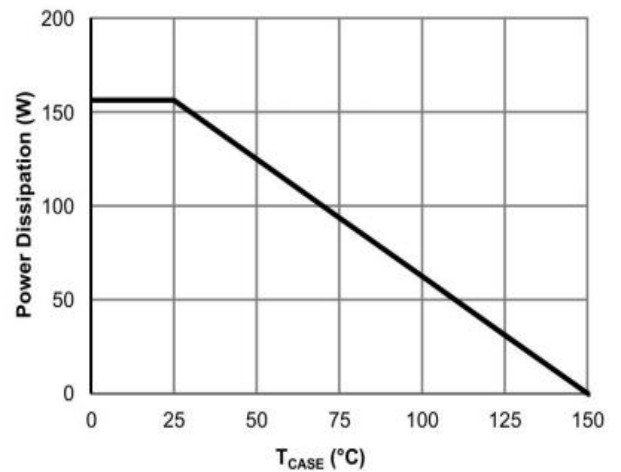


Fig.14 Current De-rating

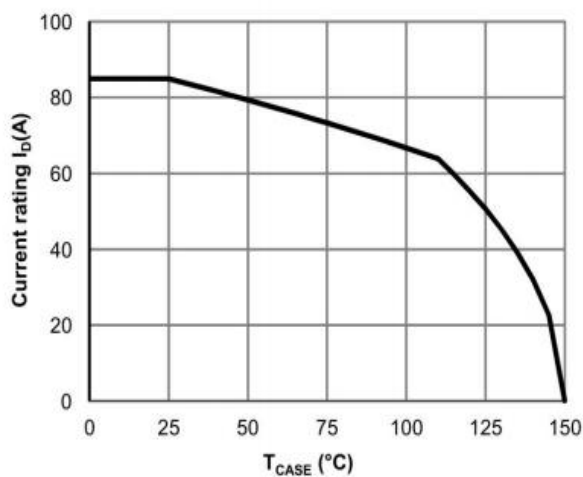


Fig.15 Single Pulse Power Rating Junction-to Ambient

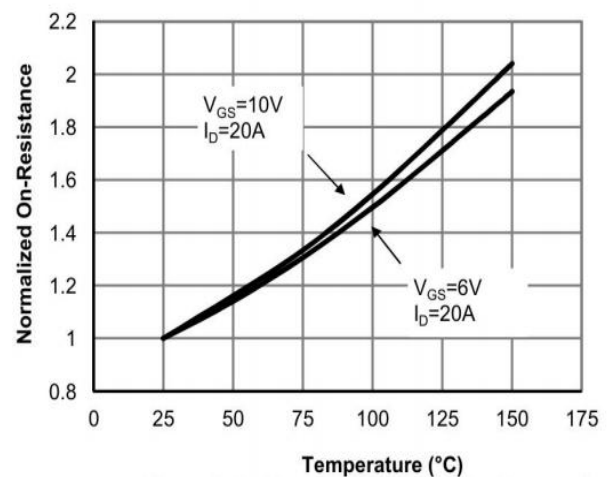


Fig.16 Normalized Maximum Transient Thermal Impedance

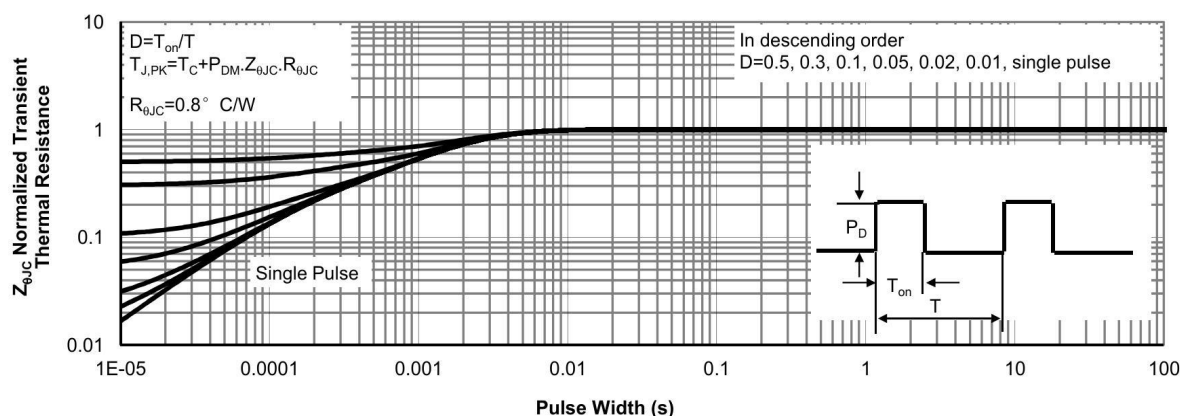


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)



6. Test Circuits

Fig.1-1 Switching times test circuit

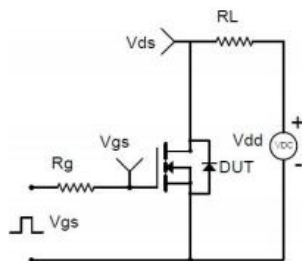


Fig.1-2 Switching Waveform

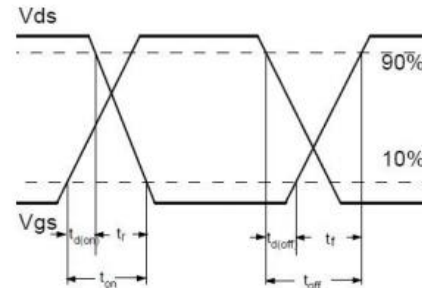


Fig.2-1 Gate charge test circuit

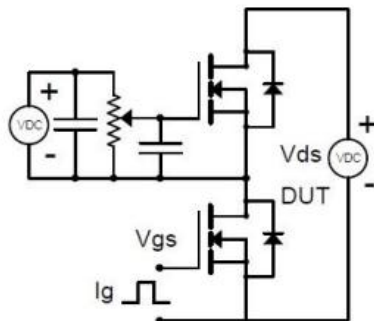


Fig.2-2 Gate charge waveform

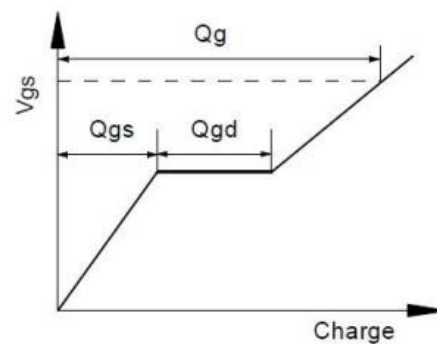


Fig.3-1 Avalanche test circuit

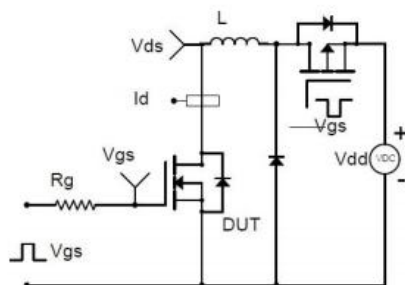
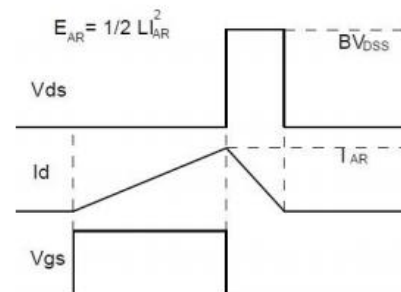
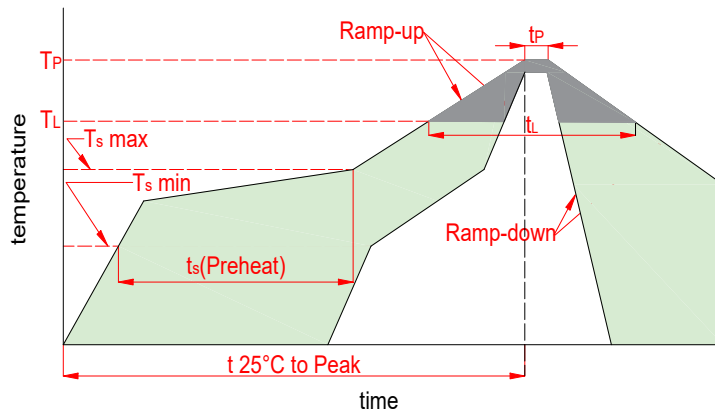


Fig.3-2 Avalanche waveform



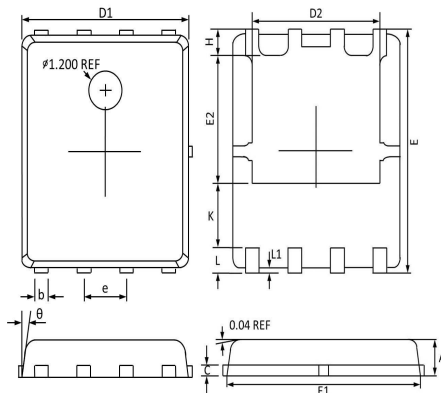


7. Soldering Parameters



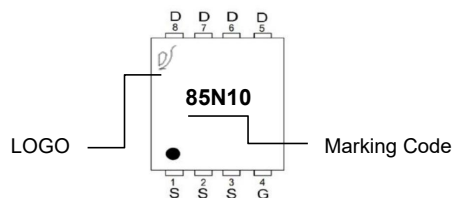
Reflow Condition		Lead-free
Pre Heat	Temp. min($T_s(\min)$)	150°C
	Temp. max($T_s(\min)$)	200°C
	Time(min to max)(t_s)	60~180s
Aver. ramp up rate(Liquidus Temp.)(T_L)to peak		3°C/s max
$T_s(\max)$ to T_L -Ramp-up Rate		3°C/s max
Reflow	Temp.(T_L)(Liquidus)	217°C
	Temp.(t_L)(Liquidus)	60~150s
Peak Temp.(T_p)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

8. Dimensions



Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.031	0.043	0.80	1.10
b	0.010	0.014	0.25	0.35
C	0.008	0.012	0.20	0.30
D1	0.189	0.201	4.80	5.10
D2	0.142	0.165	3.61	4.20
E	0.228	0.244	5.80	6.20
E1	0.222	0.232	5.65	5.90
E2	0.130	0.149	3.30	3.78
e	0.050(BSC)		1.270(BSC)	
K	0.043	0.059	1.10	1.50
L	0.018	0.030	0.45	0.75

8. Part Marking System



9. Package Information

Package	Part Number	Marking Code
PDFN5*6	XNM85N10DF	85N10



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