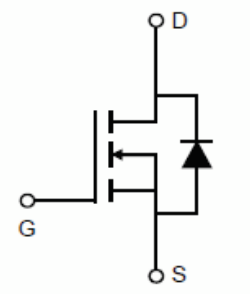
RECTRON SEMICONDUCTOR
TECHNICAL SPECIFICATION

RM85N150DF

N-Channel Enhancement Mode Power MOSFET

Description

The RM85N150DF uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.



Schematic Diagram

Features

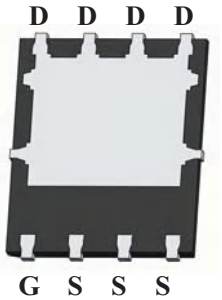
- 150V,85A
  $R_{DS(ON)}$ <9.5mΩ @V_{GS}=10V TYP:8.6mΩ
- Split Gate Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge

Applications

- DC/DC converter
- Load Switch for Portable Devices
- Synchronous Rectification
- Halogen-free

100% UIS TESTED!
100% ΔVds TESTED!

Top View



Bottom View

Package Marking and Ordering Information

Device Marking	Device	Device Package	Packaging Code	Reel Size	Quantity(PCS)
85N150	RM85N150DF	DFN5X6-8L	-W	13inch	5000

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (Tc=25℃) (1)	I_D	85	A
Continuous Drain Current (Tc=100℃)	I_D	55	A
Pulsed Drain Current (1)	I_{DM}	340	A
Drain Power Dissipation	P_D	139	W
Single Pulsed Avalanche Energy (2)	E_{AS}	672	mJ
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.9	℃/W
Thermal Resistance from Junction to Ambient (3)	$R_{\theta JA}$	43	℃/W
Junction Temperature	T_J	-55~ +150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_J=25℃ unless otherwise noted)

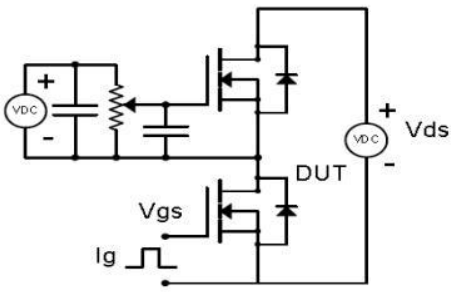
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	150	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =150V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	2.5	3.4	4.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =20A	-	8.6	9.5	mΩ
Forward transconductance	R_g	f=1.0MHz	-	2.2	-	Ω
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =75V, VGS=0V, f=1MHz	-	2330	-	pF
Output Capacitance	C_{oss}		-	315	-	
Reverse Transfer Capacitance	C_{rss}		-	17	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=75V, I_D=20A, R_G=3Ω, V_{GS}=10V	-	8.5	-	ns
Turn-on rise time	t_r		-	17	-	
Turn-off delay time	$t_{d(off)}$		-	28	-	
Turn-off fall time	t_f		-	22	-	
Total Gate Charge	Qg	V_{DS}=75V, I_D=20A, V_{GS}=10V	-	36	-	nC
Gate-Source Charge	Qgs		-	10	-	
Gate-Drain Charge	Qgd		-	7.5	-	
Source-Drain Diode characteristics						
Diode Forward voltage	V_{SD}	T_J=25℃, V_{GS} =0V, I_S=20A	-	0.7	1.2	V
Diode Forward current	I_S	T_C=25℃	-	-	70	A
Body Diode Reverse Recovery Time	Trr	di/dt=100A/us,IF=20A	-	76	-	ns
Body Diode Reverse Recovery Charge	Qrr	di/dt=100A/us,IF=20A	-	227	-	nC

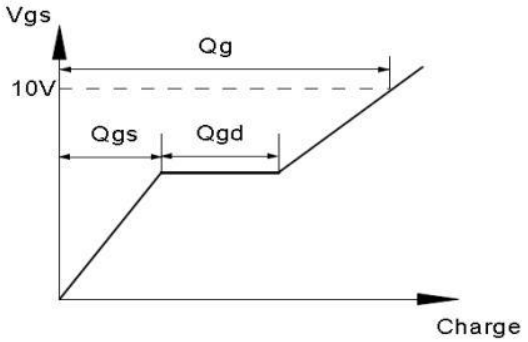
Notes:

1) Repetitive Rating: pulse width limited by maximum junction temperature
2) EAS condition : T_J=25℃, V_{DD}=30V, V_G=10V, L=0.5mH, R_g=25Ω, I_{AS}=51.8A
3) The value of RθJA Mounted on FR4 Board（25.4mm*25.4mm*t1.6mm）With 2oz Copper TA=25℃

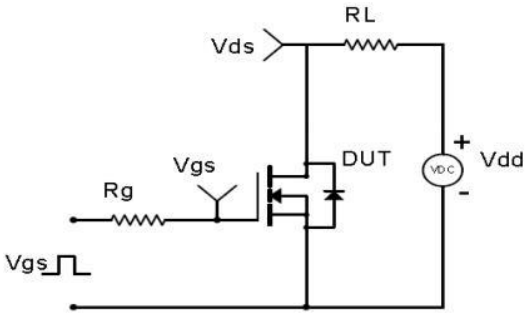
Test Circuit & Waveform

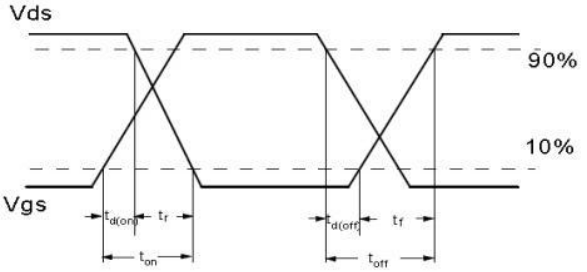
Gate Charge Test Circuit & Waveform



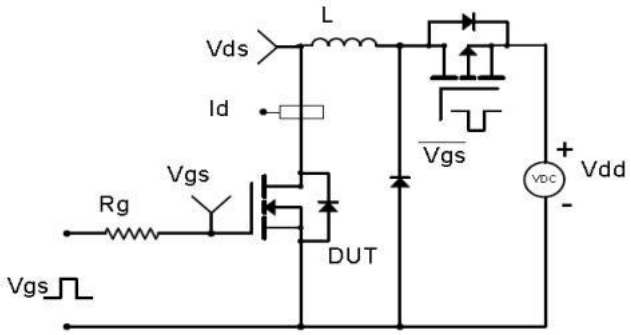


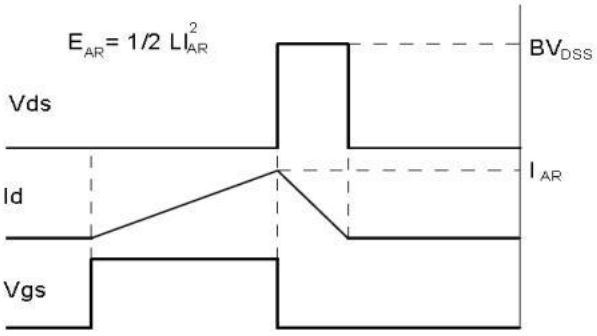
Resistive Switching Test Circuit & Waveforms



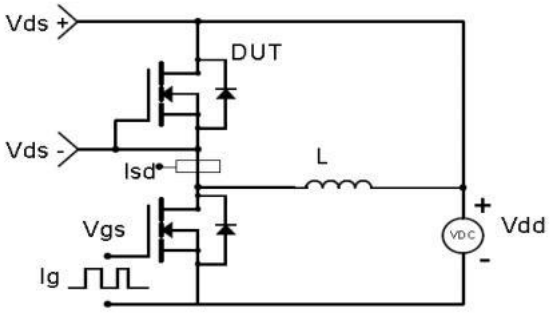


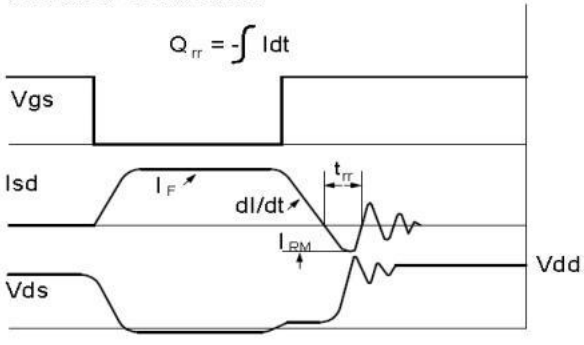
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms





Diode Recovery Test Circuit & Waveforms





RATING AND CHARACTERISTICS CURVES (RM85N150DF)

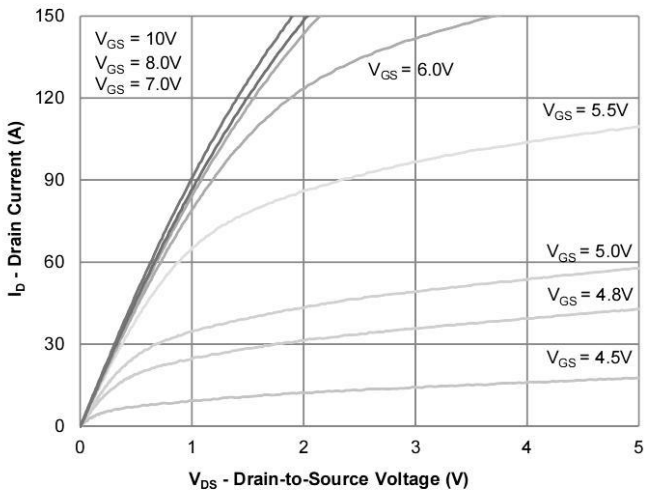


Figure 1: Output Characteristics

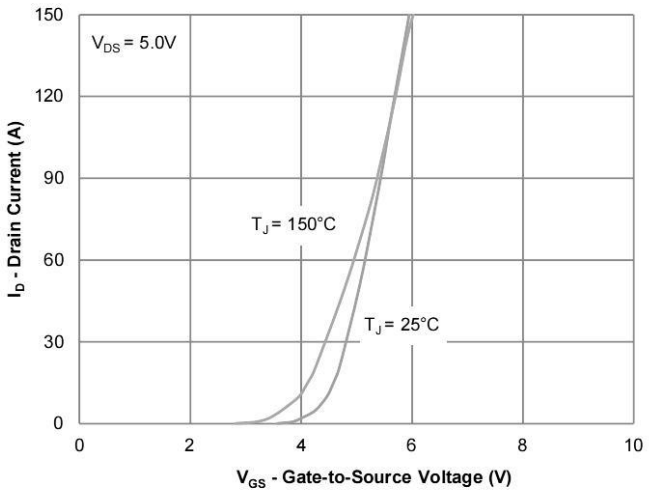


Figure 2: Transfer Characteristics

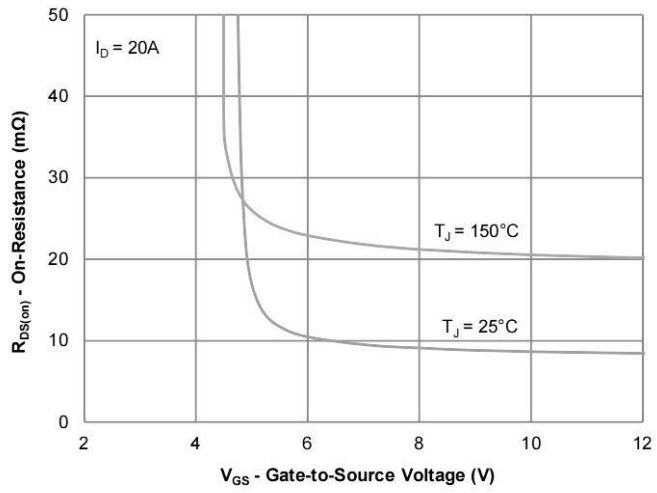


Figure 3: On-Resistance vs. Gate-Source Voltage

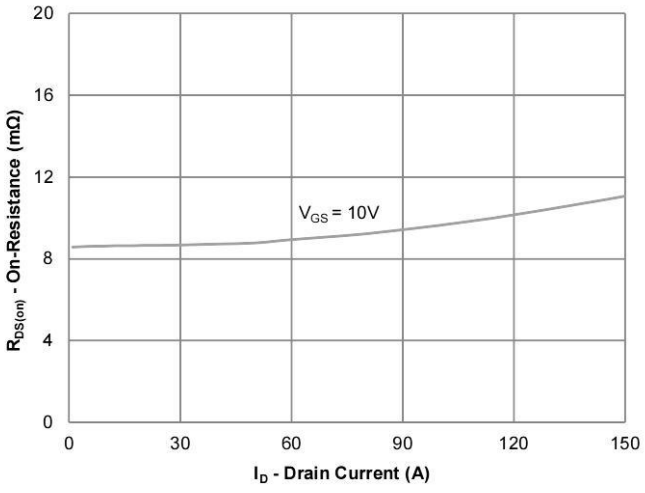


Figure 4: On-Resistance vs. Gate-Source Voltage

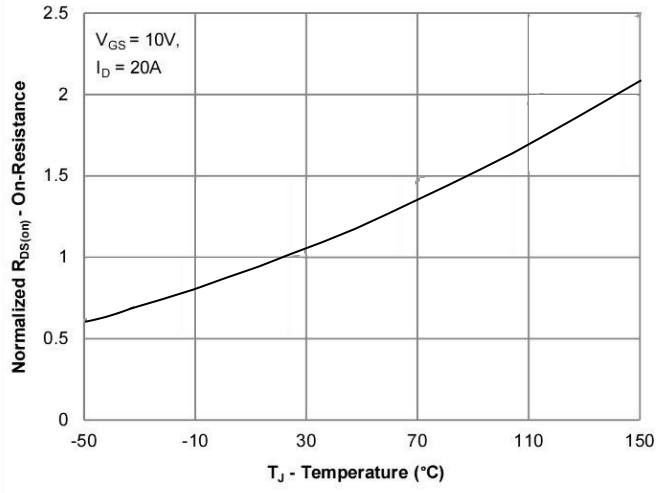


Figure 5: On-Resistance vs. Junction Temperature

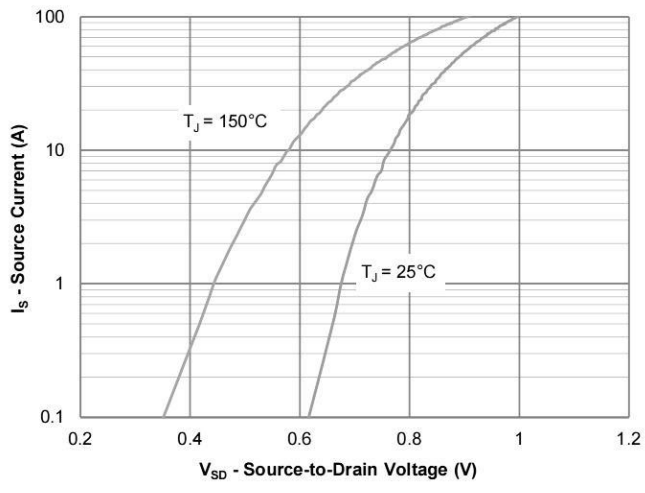


Figure 6: Source-Drain Diode Forward Voltage

RATING AND CHARACTERISTICS CURVES (RM85N150DF)

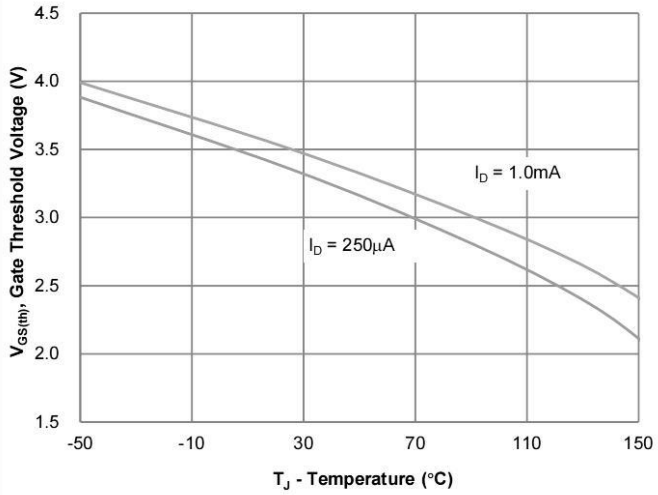


Figure 7: Gate Threshold Variation vs. Junction Temperature

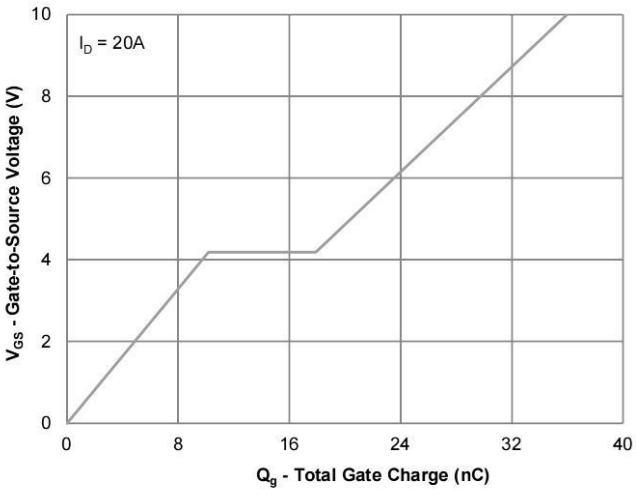


Figure 8: Gate Charge Characteristics

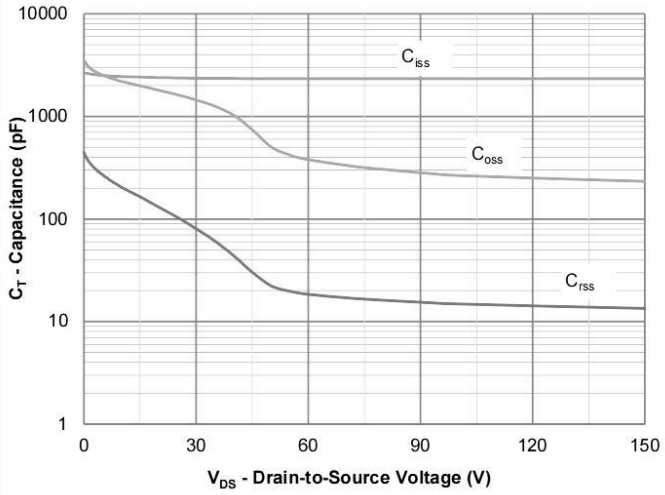


Figure 9: Capacitance Characteristics

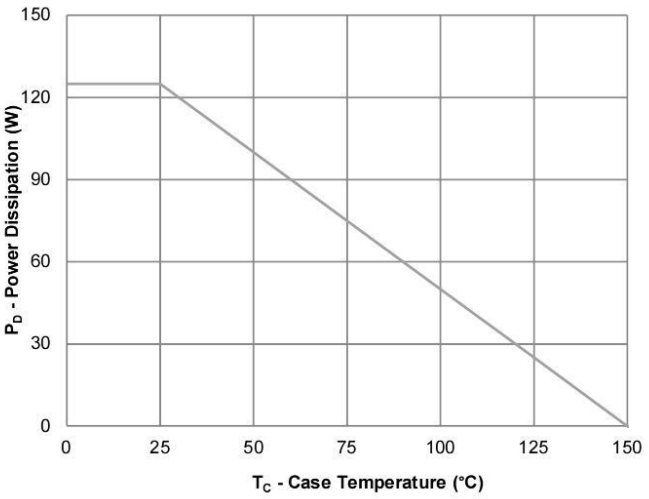


Figure 10: Power Derating

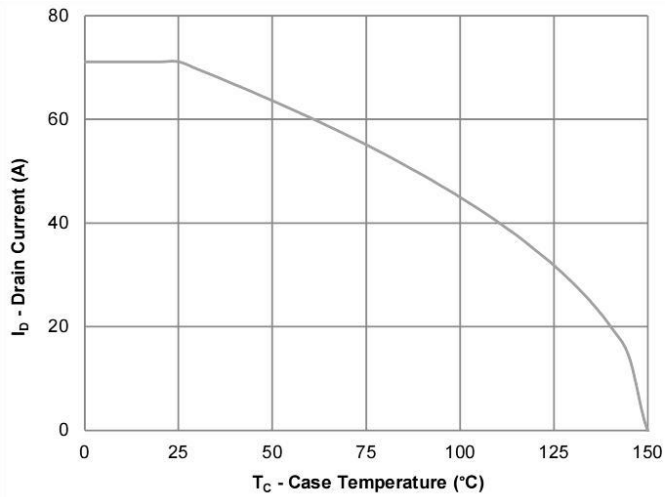


Figure 11: Current Derating

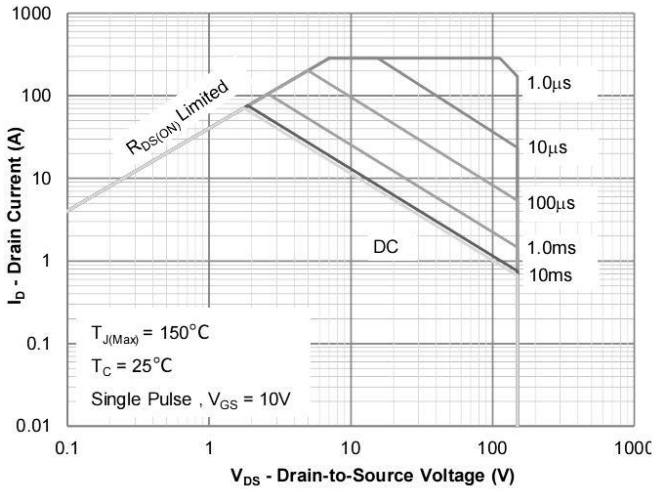


Figure 12: Safe Operating Area

RATING AND CHARACTERISTICS CURVES (RM85N150DF)

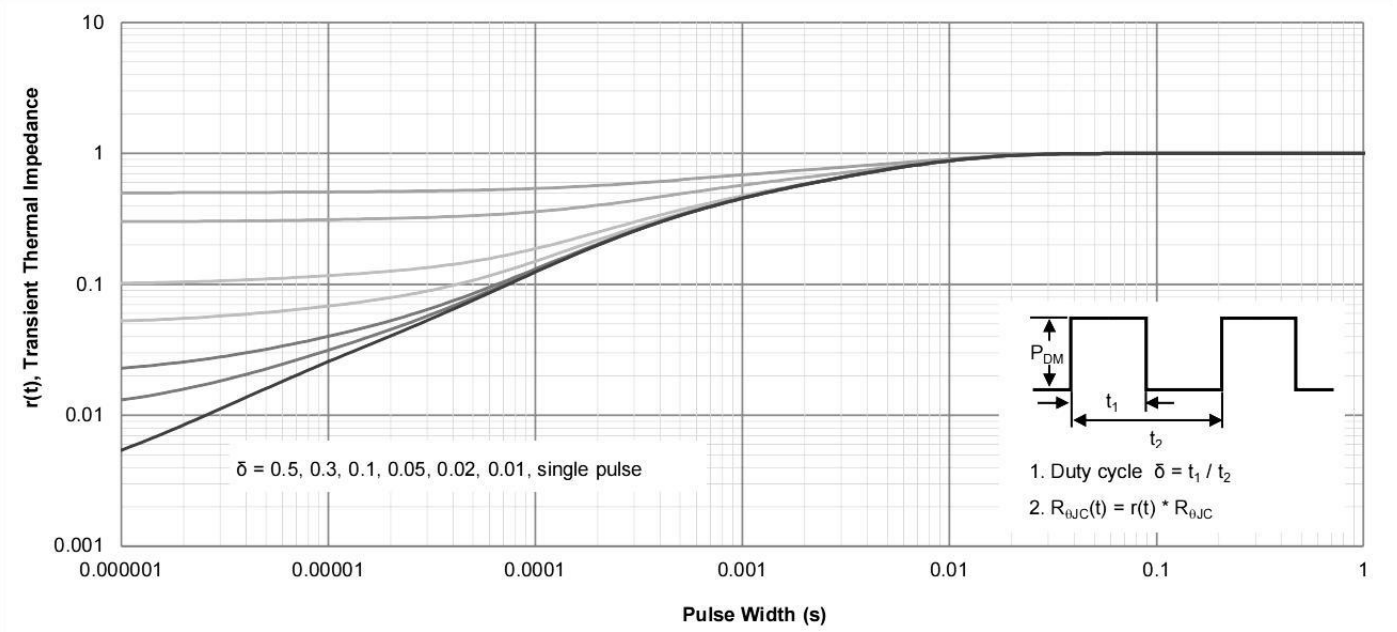
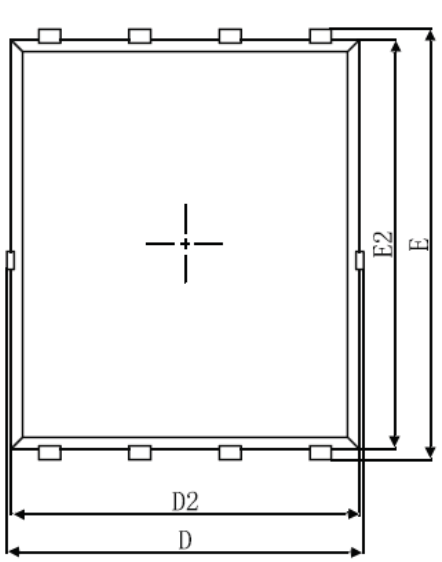
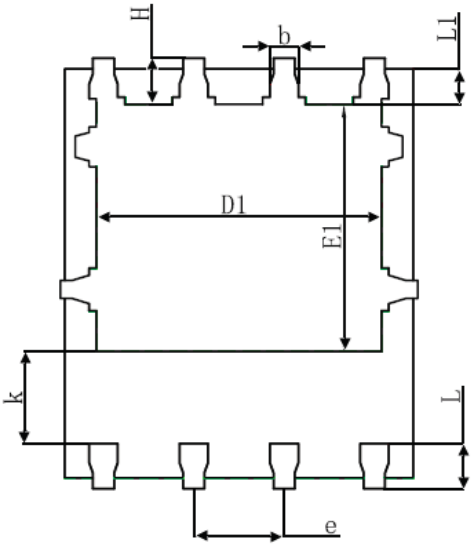


Figure 13: Normalized Maximum Transient Thermal Impedance

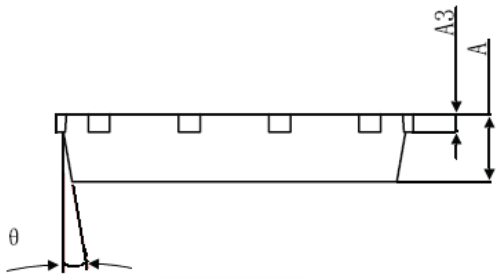
DFN5X6-8L Package Information



Top View
[顶视图]



Bottom View
[背视图]



Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	8°	12°	8°	12°

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