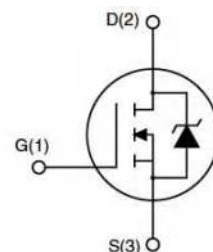


N-Channel Enhancement Mosfet

Features

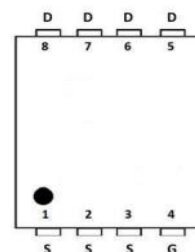
- 100V, 140A
 $R_{DS(ON)} < 3.3m\Omega @ V_{GS}=10V$ TYP: 2.9m Ω
- Split Gate Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge



Schematic Diagram

Applications

- Power management
- DC/DC converters
- Halogen-free



pin Assignment

Package Marking and Ordering Information

Device Marking	Device	Device Package	Packaging Code	Reel Size	Quantity(PCS)
140N100	RM140N100DF	DFN5X6-8L	-W	13inch	5000

ABSOLUTE MAXIMUM RATINGS ($T_J=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_c=25^{\circ}C$) ⁽¹⁾	I_D	140	A
Continuous Drain Current ($T_c=100^{\circ}C$)	I_D	99	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	560	A
Drain Power Dissipation	P_D	150	W
Single Pulsed Avalanche Energy ⁽²⁾	E_{AS}	1000	mJ
Thermal Resistance from Junction to Ambient ⁽³⁾	$R_{\theta JA}$	43	$^{\circ}C/W$
Thermal Resistance from Junction to Case	$R_{\theta JC}$	1.0	$^{\circ}C/W$
Junction Temperature	T_J	-55~ +175	$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +175	$^{\circ}C$

Notes:

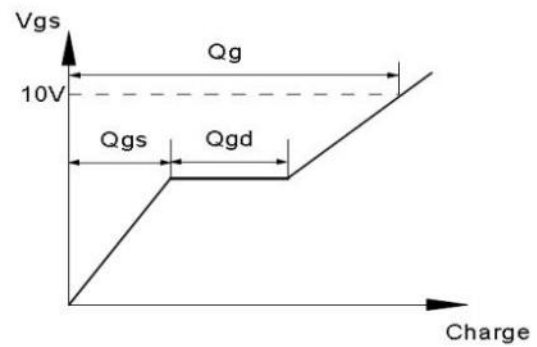
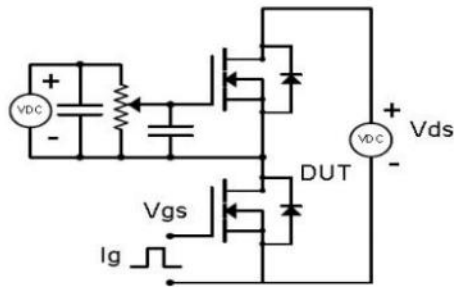
- 1) Repetitive Rating: pulse width limited by maximum junction temperature
- 2) EAS condition : $T_J=25^{\circ}C$, $V_{DD}=50V$, $V_G=10V$, $L=1.0mH$, $R_g=25\Omega$, $I_{AS}=44.7A$
- 3) The value of $R_{\theta JA}$ Mounted on FR4 Board (25.4mm*25.4mm*t1.6mm) With 2oz Copper $T_A=25^{\circ}C$

MOSFET ELECTRICAL CHARACTERISTICS($T_J=25^{\circ}\text{C}$ unless otherwise noted)

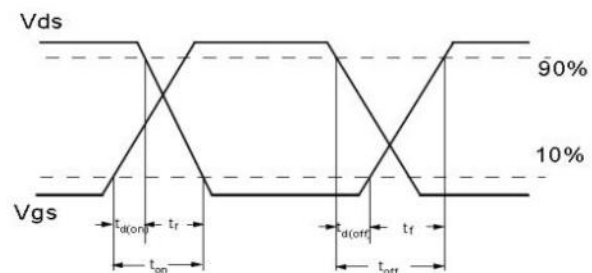
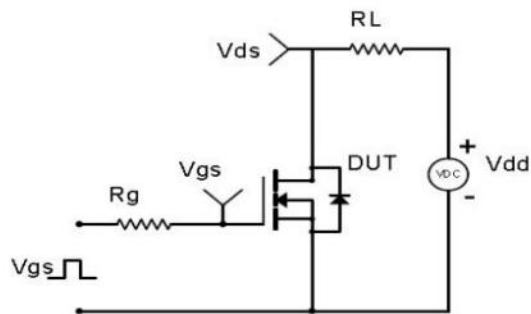
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	100	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =100V, V _{GS} = 0V	-	-	1	μA
Gate-body leakage current	I _{GSS}	V _{GS} ±20V, V _{DS} = 0V	-	-	±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.0	3.0	4.0	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A	-	2.9	3.3	mΩ
Forward transconductance	R _g	V _{GS} = 0V, V _{DS} = 0V, f=1.0MHz	-	2.0	-	Ω
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f=1MHz	-	4628	-	pF
Output Capacitance	C _{oss}		-	1624	-	
Reverse Transfer Capacitance	C _{rss}		-	19	-	
Switching characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} =50V, I _D =20A, R _G =3Ω, V _{GS} =10V	-	12	-	nS
Turn-on rise time	t _r		-	26	-	
Turn-off delay time	t _{d(off)}		-	38	-	
Turn-off fall time	t _f		-	31	-	
Total Gate Charge	Q _g	V _{DS} =50V, I _D =20A, V _{GS} =10V	-	61	-	nC
Gate-Source Charge	Q _{gs}		-	19.5	-	
Gate-Drain Charge	Q _{gd}		-	8.7	-	
Source-Drain Diode characteristics						
Diode Forward voltage	V _{SD}	T _J =25℃, V _{GS} =0V, I _S =20A	-	0.8	1.2	V
Diode Forward current	I _S	T _C =25℃	-	-	140	A
Body Diode Reverse Recovery Time	t _{rr}	T _J =25℃, I _F =20A,di/dt=100A/us	-	77	-	nS
Body Diode Reverse Recovery Charge	Q _{rr}		-	189	-	nC

Test Circuit & Waveform

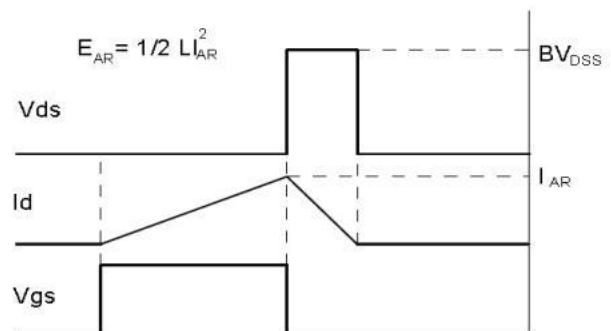
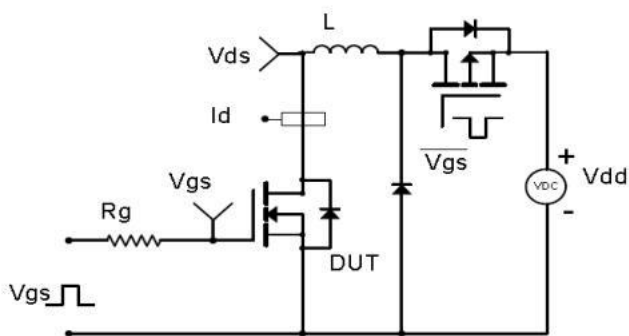
Gate Charge Test Circuit & Waveform



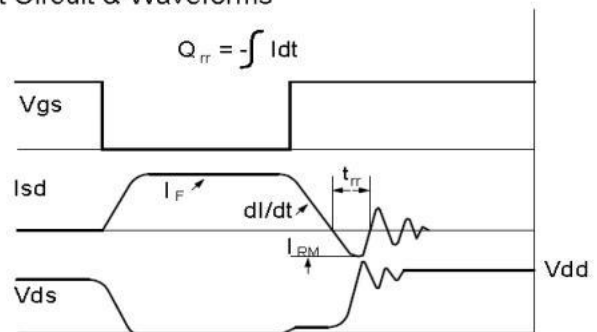
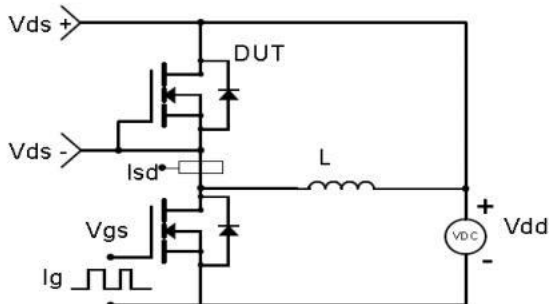
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



RATING AND CHARACTERISTICS CURVES (RM140N100DF)

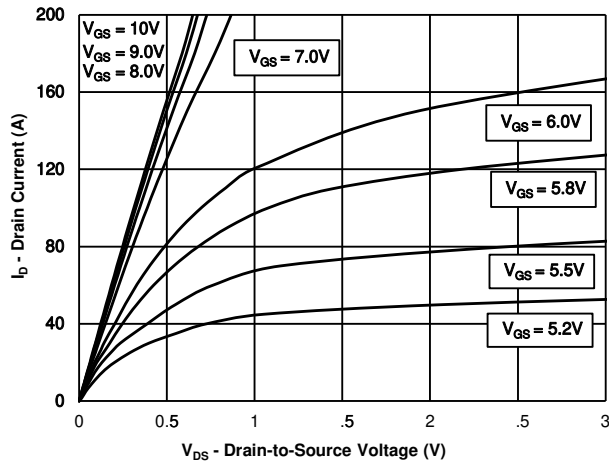


Figure 1: Output Characteristics

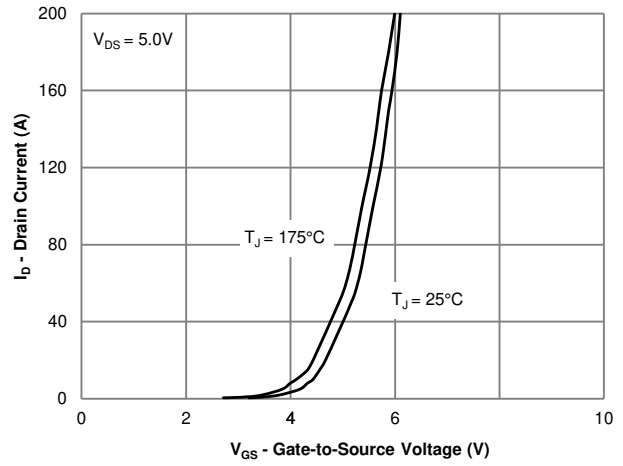


Figure 2: Transfer Characteristics

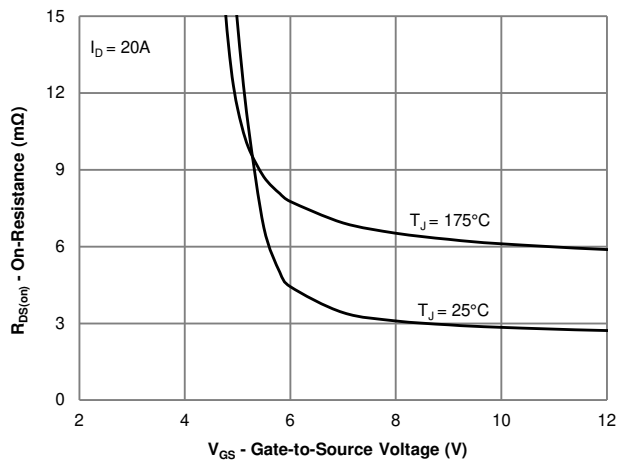


Figure 3: On-Resistance vs. Gate-Source Voltage

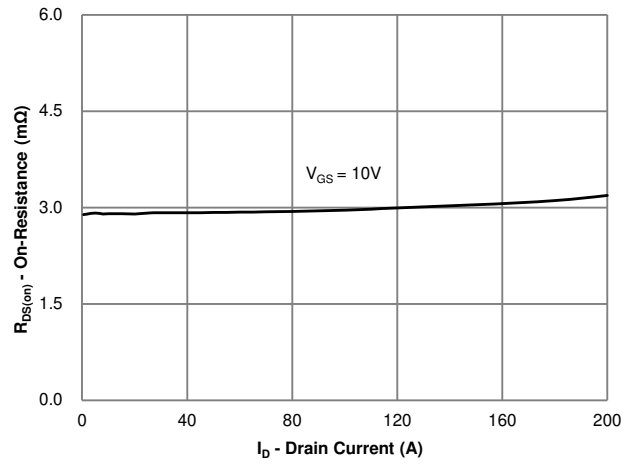


Figure 4: On-Resistance vs. Drain Current

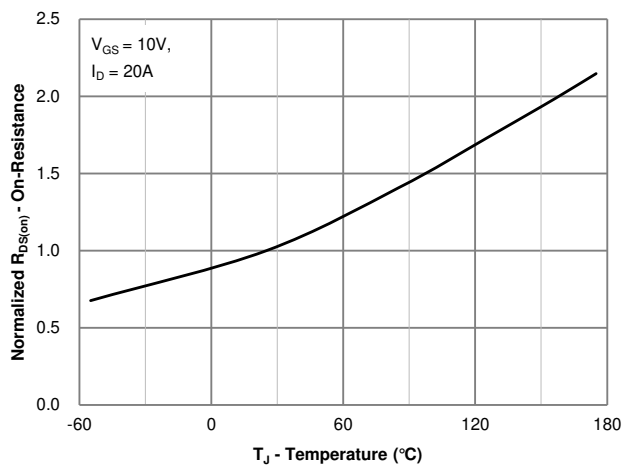


Figure 5: On-Resistance vs. Junction Temperature

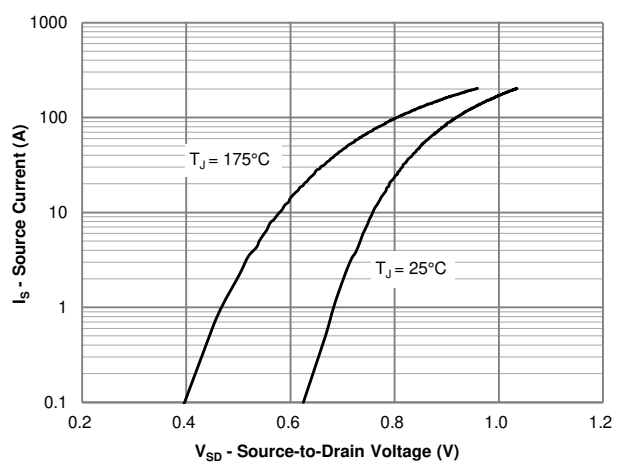


Figure 6: Source-Drain Diode Forward Voltage

RATING AND CHARACTERISTICS CURVES (RM140N100DF)

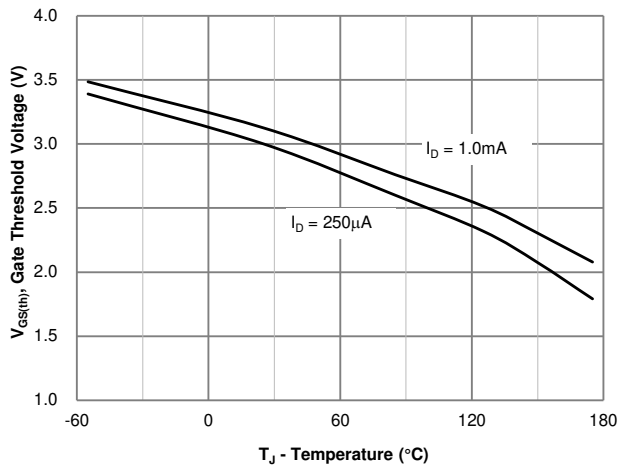


Figure 7: Gate Threshold Variation vs. Junction Temperature

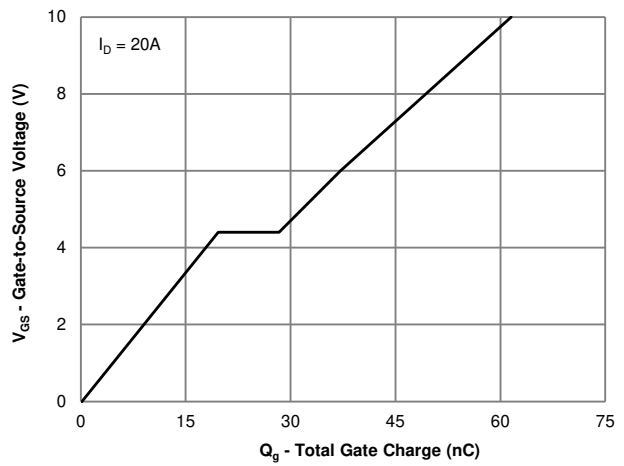


Figure 8: Gate Charge Characteristics

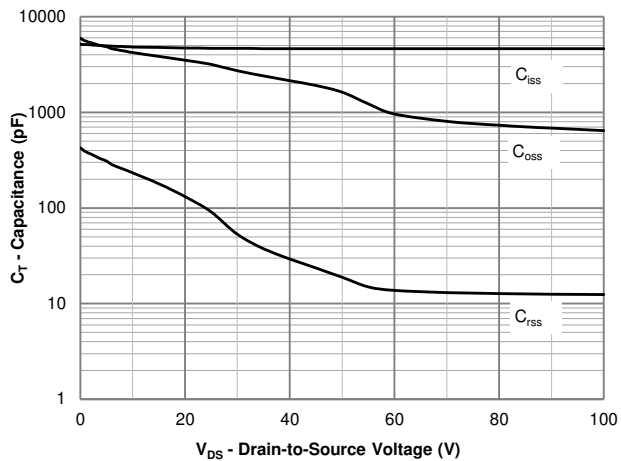


Figure 9: Capacitance Characteristics

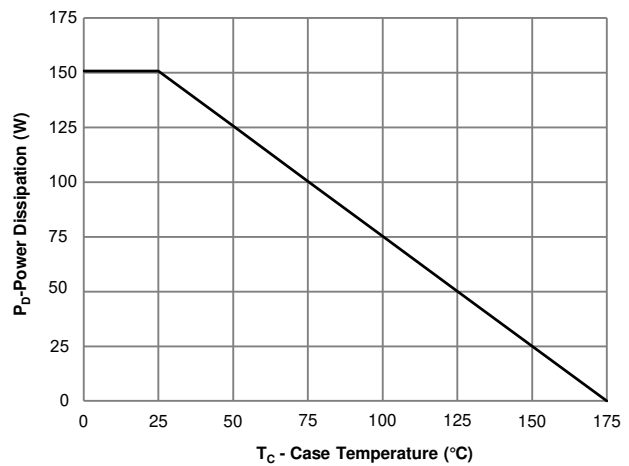


Figure 10: Power Derating

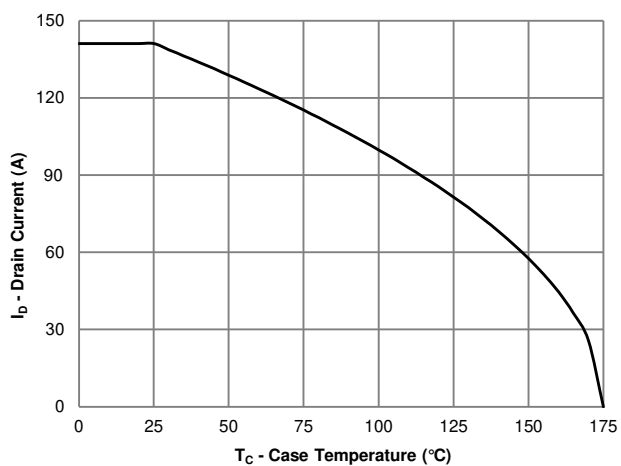


Figure 11: Current Derating

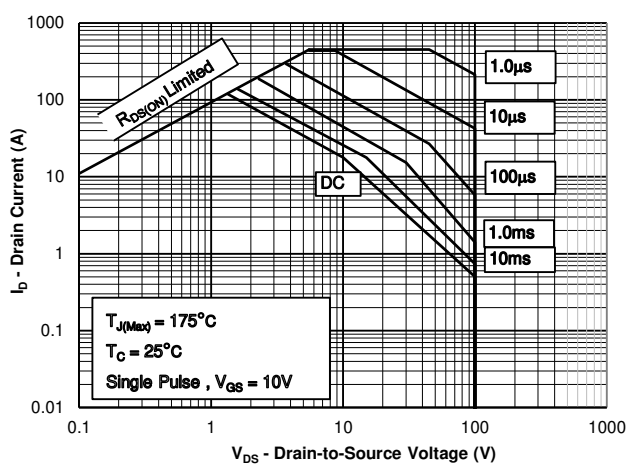
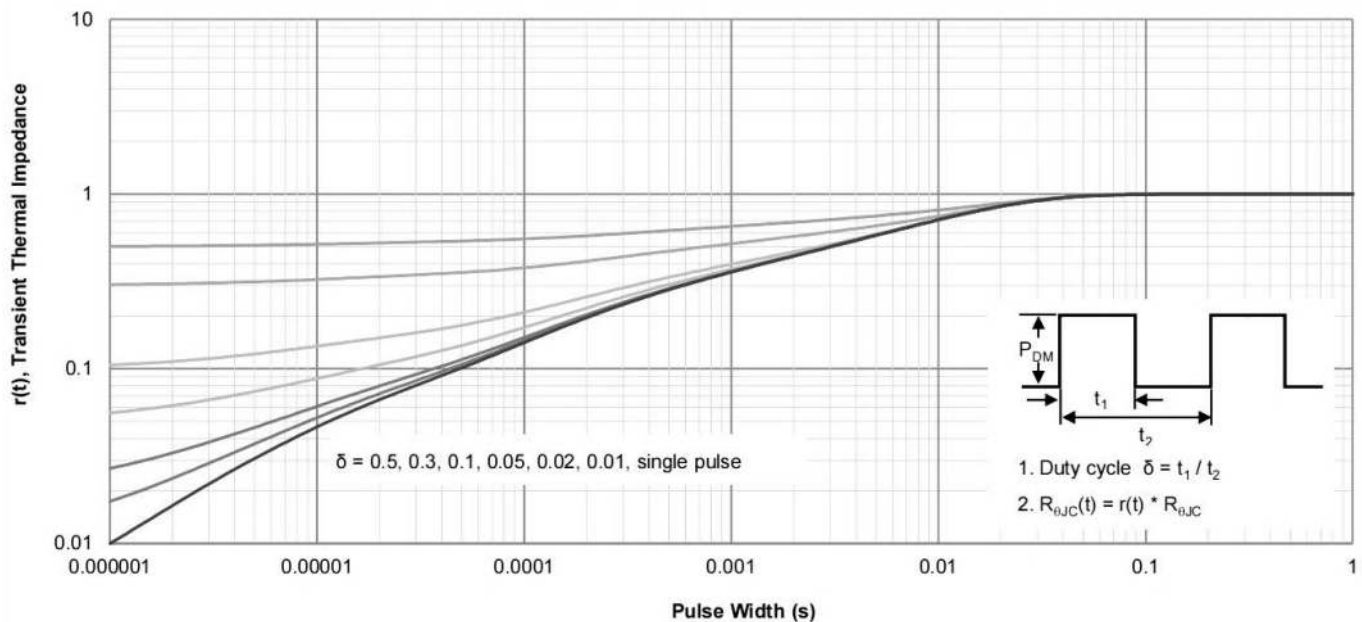


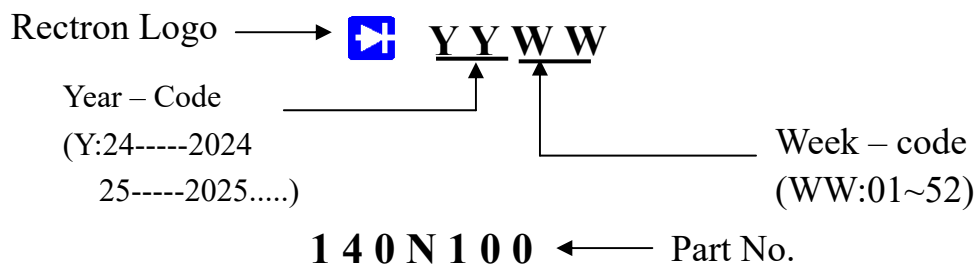
Figure 12: Safe Operating Area

RATING AND CHARACTERISTICS CURVES (RM140N100DF)

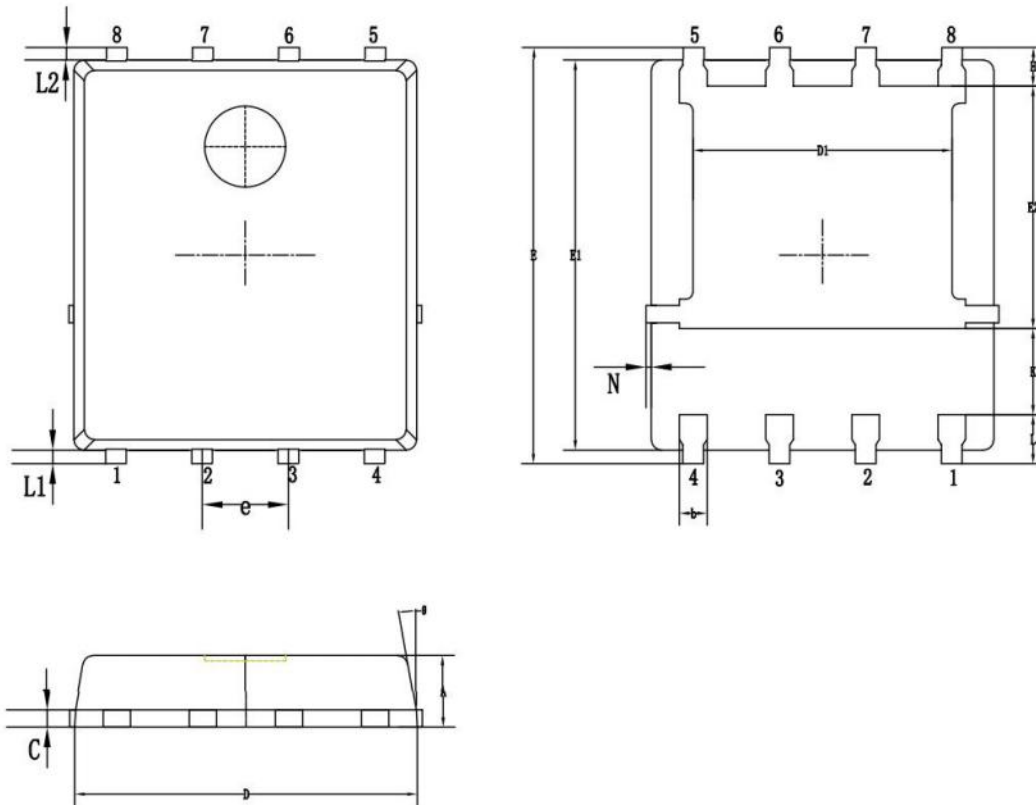


RECTRON

Marking on the body



DFN5X6 Package Information



Symbols	Millimeters		
	MIN.	NOM.	MAX.
A	0.90	1.05	1.20
b	0.35	0.40	0.50
C	0.20	0.25	0.35
D	4.80	5.05	5.20
D1	3.80	3.90	4.10
E	5.90	6.00	6.20
E1	5.60	5.75	5.90
E2	3.40	3.50	3.60
e	1.27 BSC.		
H	0.40	0.60	0.70
K	1.17	1.27	1.37
L	0.50	0.74	0.84
L1/L2	0.10	0.16	0.20
θ	8°	10°	12°
N	0	-	0.15

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