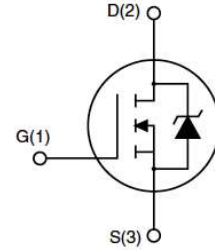


N-Channel Enhancement Mosfet

Features

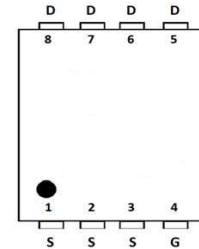
- 100V, 140A
 $R_{DS(ON)} < 3.3m\Omega @ V_{GS}=10V$ TYP: $2.9m\Omega$
- Split Gate Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge



Schematic Diagram

Applications

- Power management
- DC/DC converters
- P/N suffix V means AEC-Q101 qualified, e.g: RM140N100DFV
- Halogen-free



pin Assignment

Package Marking and Ordering Information

Device Marking	Device	Device Package	Packaging Code	Reel Size	Quantity(PCS)
140N100V	RM140N100DFV	DFN5X6-8L	-W	13inch	5000

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_c=25^\circ\text{C}$) ⁽¹⁾	I_D	140	A
Continuous Drain Current ($T_c=100^\circ\text{C}$)	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	$^\circ\text{C/W}$
Thermal Resistance from Junction to Case	$R_{\theta JC}$	1.0	$^\circ\text{C/W}$
Junction Temperature	T_J	-55~ +175	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +175	$^\circ\text{C}$

Notes:

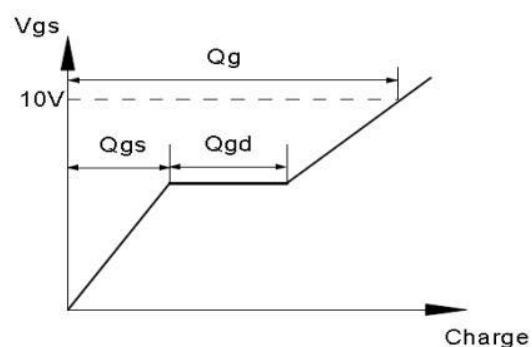
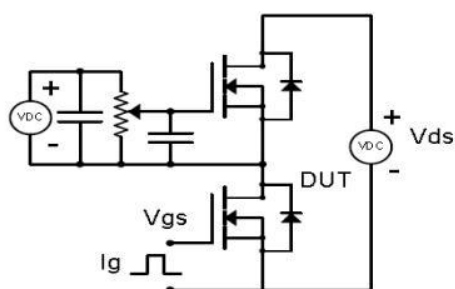
- 1) Repetitive Rating: pulse width limited by maximum junction temperature
- 2) EAS condition : $T_J=25^\circ\text{C}$, $V_{DD}=50\text{V}$, $V_G=10\text{V}$, $L=1.0\text{mH}$, $R_g=25\Omega$, $I_{AS}=44.7\text{A}$
- 3) The value of $R_{\theta JA}$ Mounted on FR4 Board (25.4mm*25.4mm*t1.6mm) With 2oz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

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

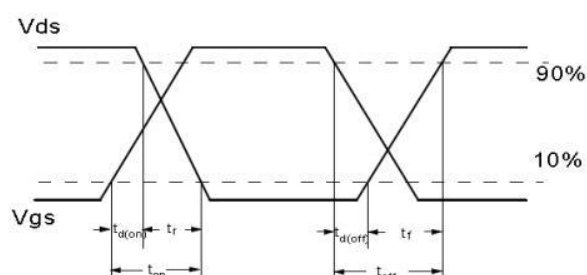
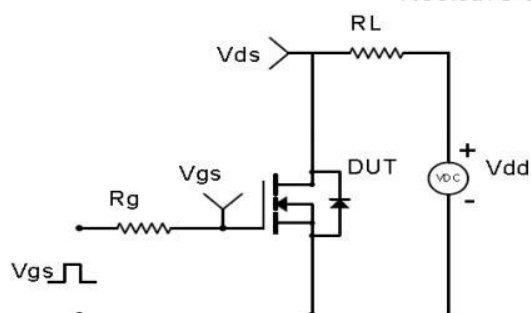
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	100	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =100V, V _{GS} = 0V	-	-	1	μA
Gate-body leakage current	I _{GSS}	V _{GS} ±20V, V _{DS} = 0V	-	-	±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, VGS=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	Qg	V _{DS} =50V, I _D =20A, V _{GS} =10V	-	61	-	nC
Gate-Source Charge	Qgs		-	19.5	-	
Gate-Drain Charge	Qgd		-	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	trr	T _J =25℃, I _F =20A,di/dt=100A/us	-	77	-	nS
Body Diode Reverse Recovery Charge	Qrr		-	189	-	nC

Test Circuit & Waveform

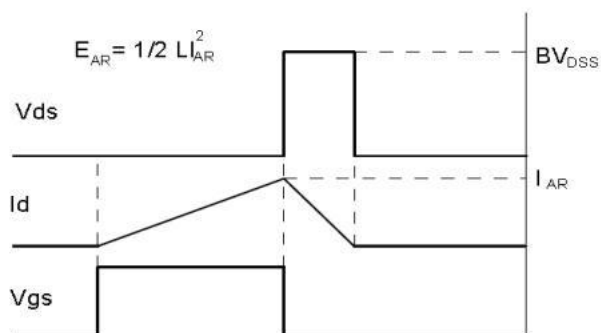
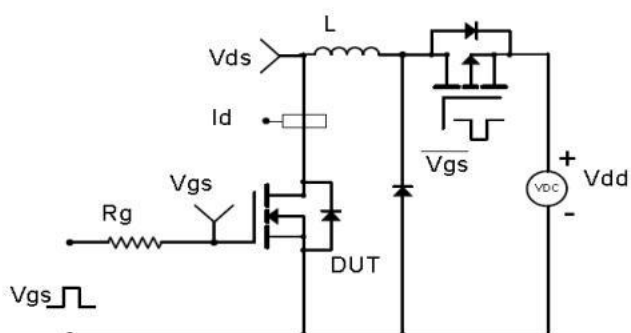
Gate Charge Test Circuit & Waveform



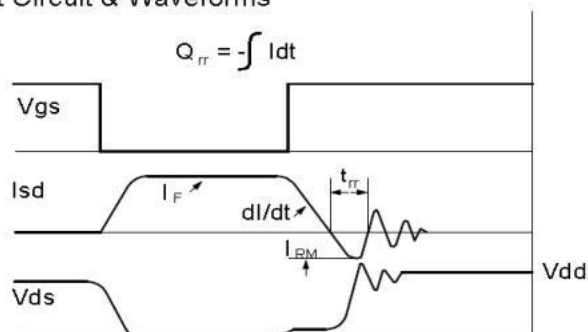
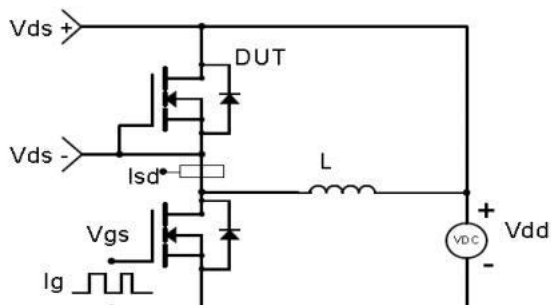
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



RATING AND CHARACTERISTICS CURVES (RM140N100DFV)

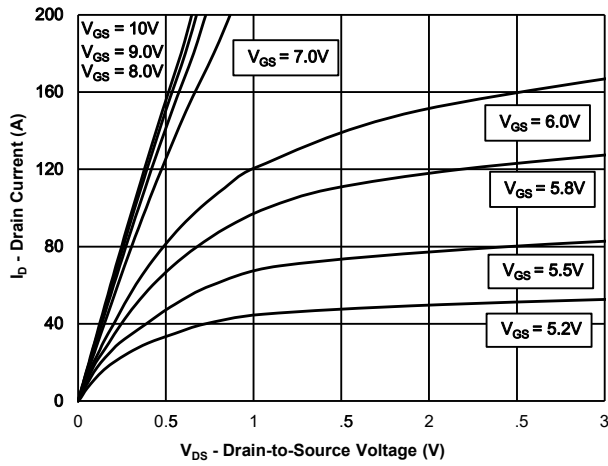


Figure 1: Output Characteristics

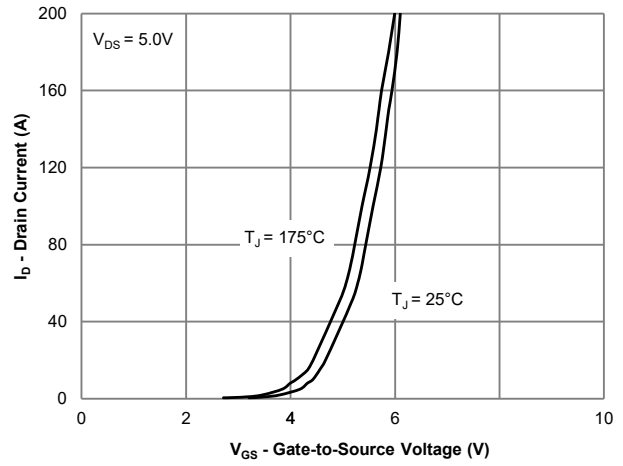


Figure 2: Transfer Characteristics

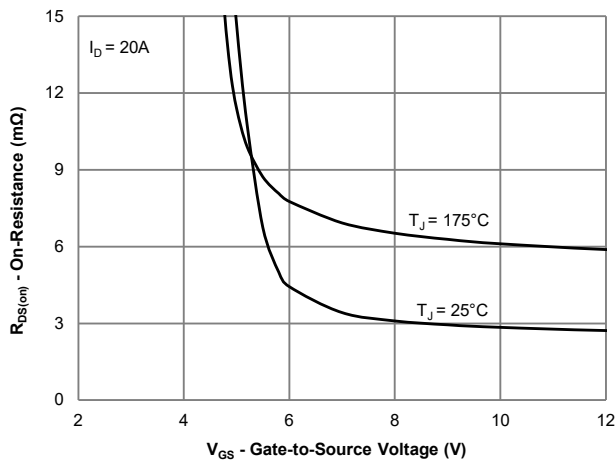


Figure 3: On-Resistance vs. Gate-Source Voltage

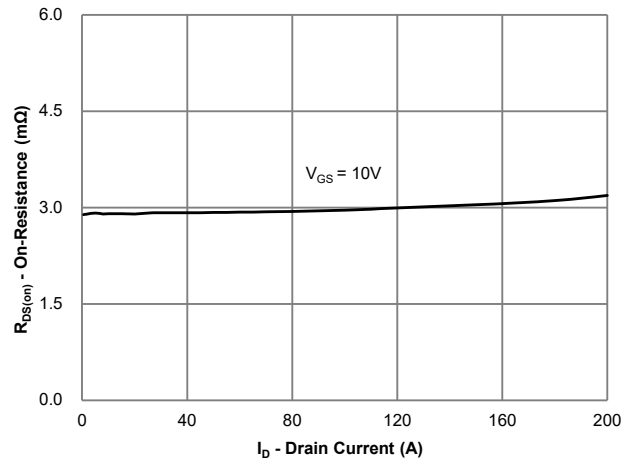


Figure 4: On-Resistance vs. Gate-Source Voltage

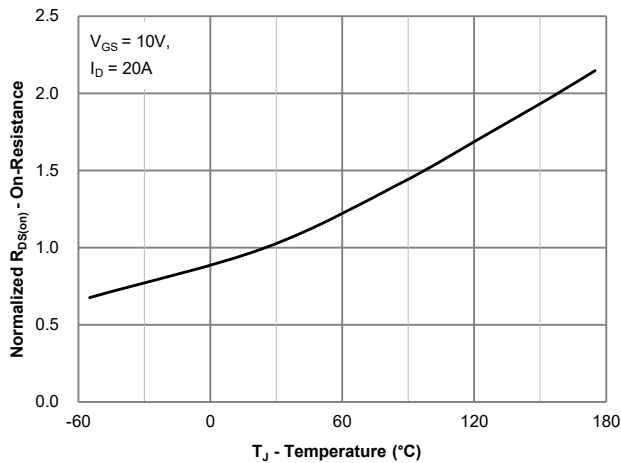


Figure 5: On-Resistance vs. Junction Temperature

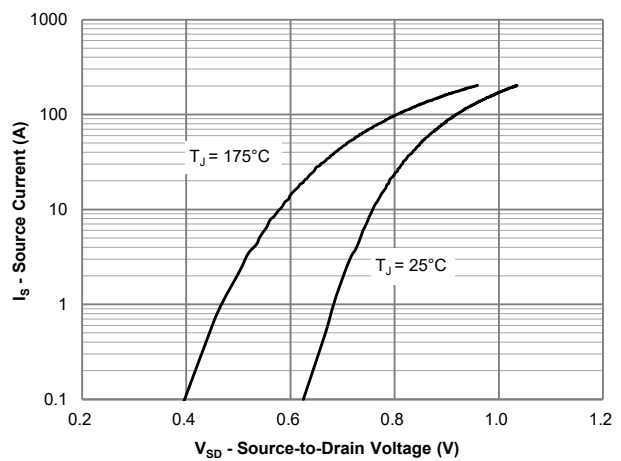


Figure 6: Source-Drain Diode Forward Voltage

RATING AND CHARACTERISTICS CURVES (RM140N100DFV)

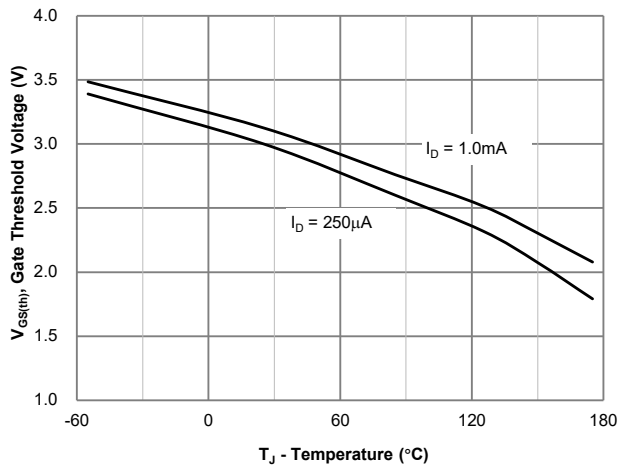


Figure 7: Gate Threshold Variation vs. Junction Temperature

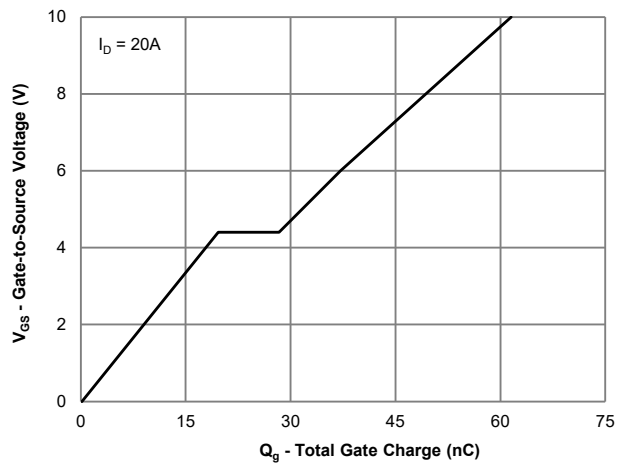


Figure 8: Gate Charge Characteristics

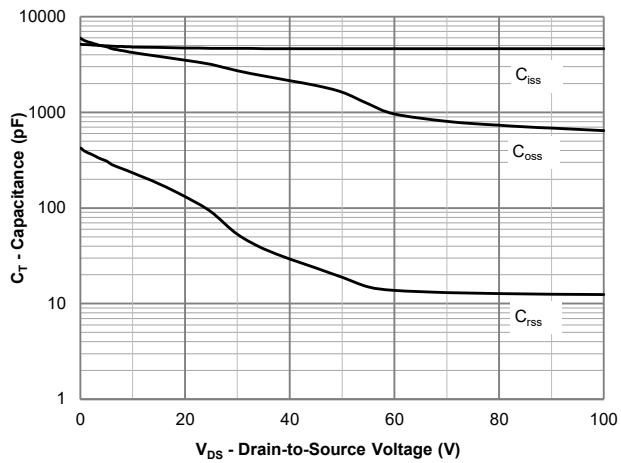


Figure 9: Capacitance Characteristics

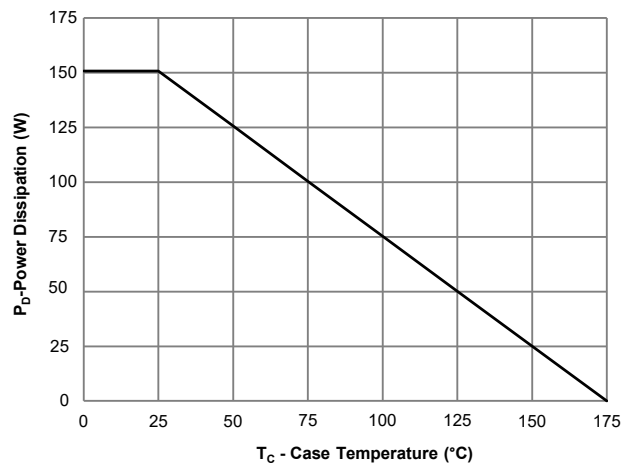


Figure 10: Power Derating

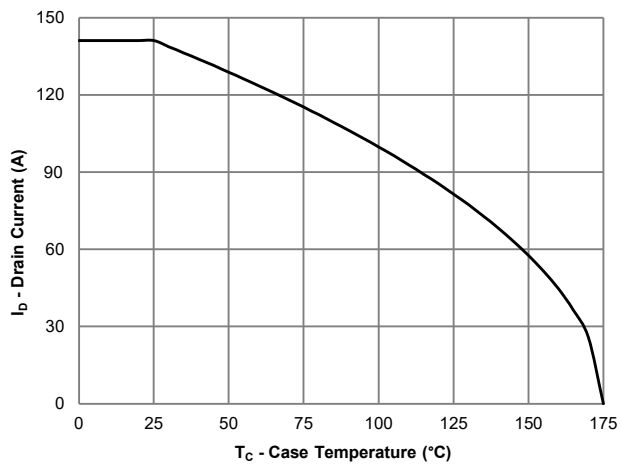


Figure 11: Current Derating

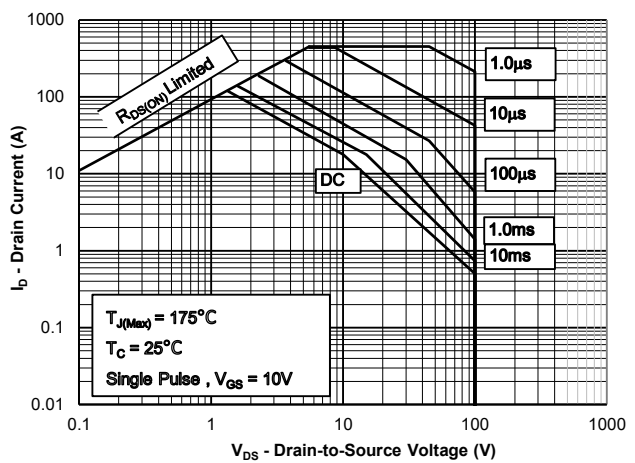
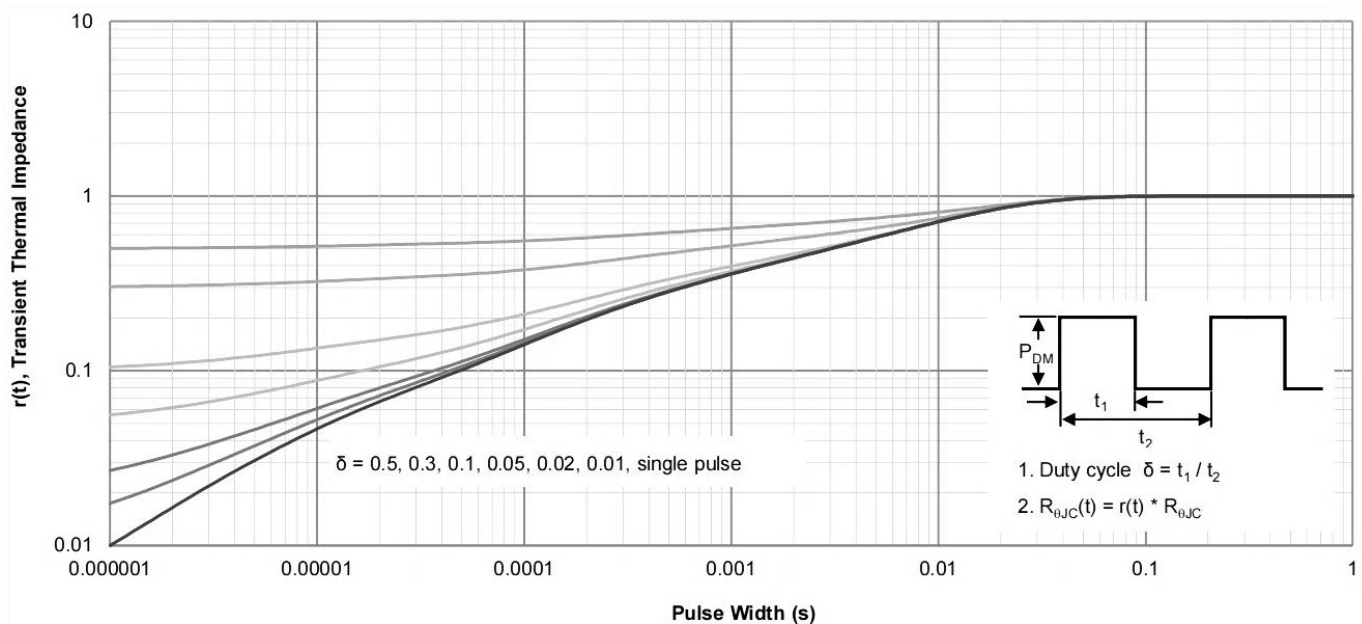


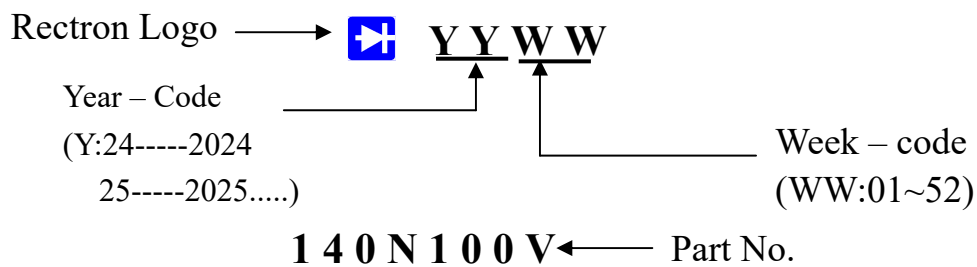
Figure 12: Safe Operating Area

RATING AND CHARACTERISTICS CURVES (RM140N100DFV)

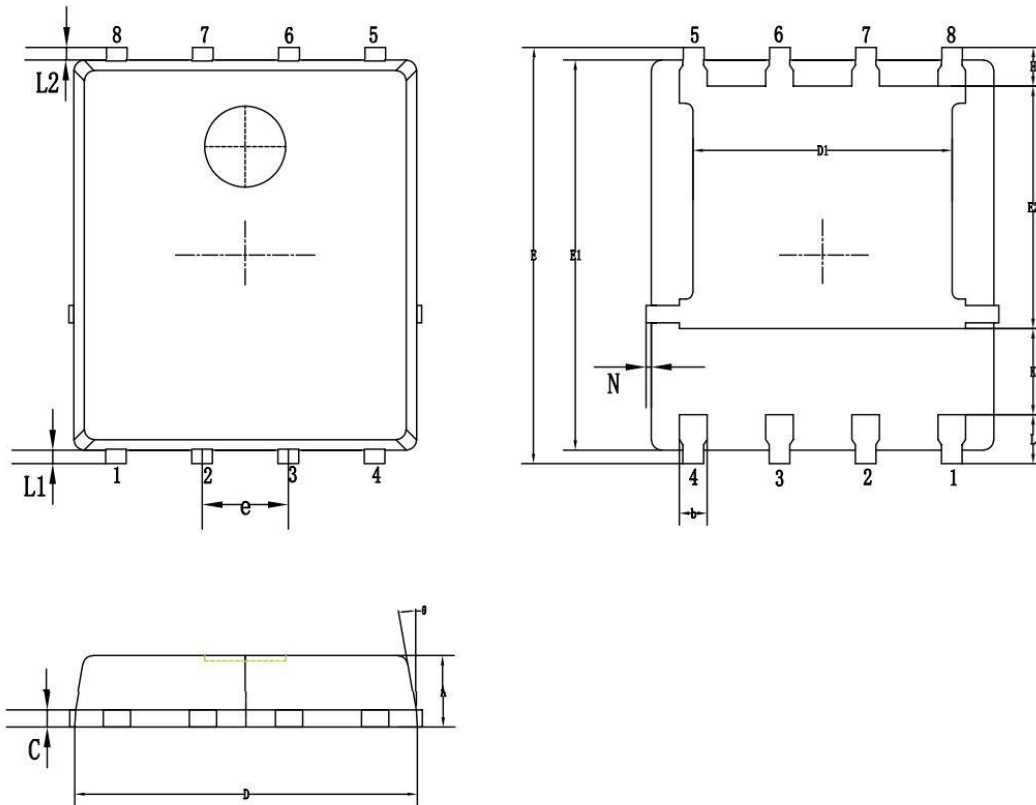


RECTRON

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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