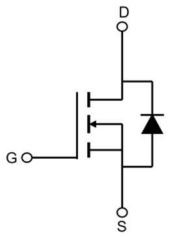
RECTRON SEMICONDUCTOR
TECHNICAL SPECIFICATION

RM160N40T2

N-Channel Enhancement Mosfet

Feature

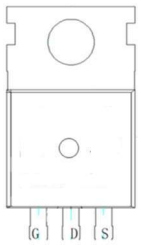
- 40V,160A
  $R_{DS(ON)}$ <2.8mΩ @V_{GS}=10V TYP:2.4 mΩ
  $R_{DS(ON)}$ <4.0mΩ @V_{GS}=4.5V TYP:3.2mΩ
- Advanced Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge



Schematic Diagram

Application

- PWM applications
- Load Switch
- Power management
- Halogen-free



pin assignment

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
160N40	RM160N40T2	TO220	-	-	1000

ABSOLUTE MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (T_a =25℃)	I_D	160	A
Continuous Drain Current (T_a =100℃)	I_D	112	A
Pulsed Drain Currenr (1)	I_{DM}	520	A
Singel Pulsed Avalanche Energy (2)	E_{AS}	245	mJ
Power Dissipation	P_D	180	W
Thermal Resistance from Junction to Case(4)	$R_{\theta JC}$	0.83	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

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

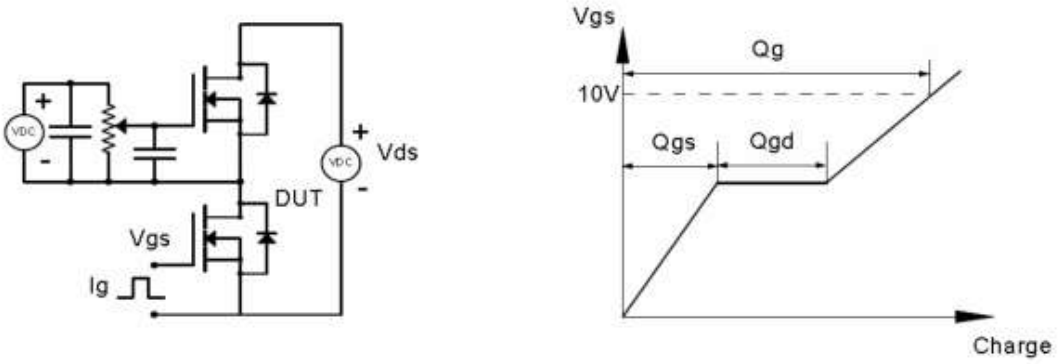
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	40	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =40V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V,V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage(3)	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1	1.5	2.2	V
Drain-source on-resistance(3)	$R_{DS(on)}$	V_{GS} =10V, I_D =50A	-	2.4	2.8	mΩ
		V_{GS} =4.5V, I_D =30A	-	3.2	4.0	
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =20V, V_{GS} =0V, f =1MHz	-	6260	-	pF
Output Capacitance	C_{oss}		-	523	-	
Reverse Transfer Capacitance	C_{rss}		-	727	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=20V, I_D=30A, R_L=1Ω V_{GS}=10V, R_G=3Ω	-	16.8	-	ns
Turn-on rise time	t_r		-	38.1	-	
Turn-off delay time	$t_{d(off)}$		-	116.4	-	
Turn-off fall time	t_f		-	33.4	-	
Total Gate Charge	Qg	VDS=20V, ID=30A, VGS=10V	-	129.6	-	nC
Gate-Source Charge	Qgs		-	20.3	-	
Gate-Drain Charge	Qgd		-	27.4	-	
Source-Drain Diode characteristics						
Diode Forward voltage(3)	V_{DS}	V_{GS} =0V, I_S=10A	-	-	1.2	V
Diode Forward current(4)	I_S		-	-	160	A
Body Diode Reverse Recovery Time	trr	T_J=25°， IF=30A,di/dt=100A/us		23.5		ns
Body Diode Reverse Recovery Charge	Qrr	T_J=25°， IF=30A,di/dt=100A/us		12.8		nc

Notes:

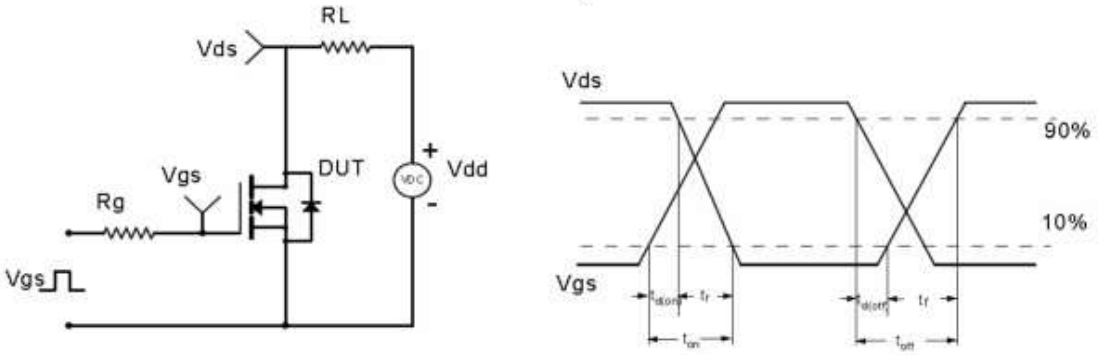
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:T_J=25℃,V_{DD}=20V,R_G=25Ω,L=0.5mH
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board,t≤10 sec

Test Circuit & Waveform

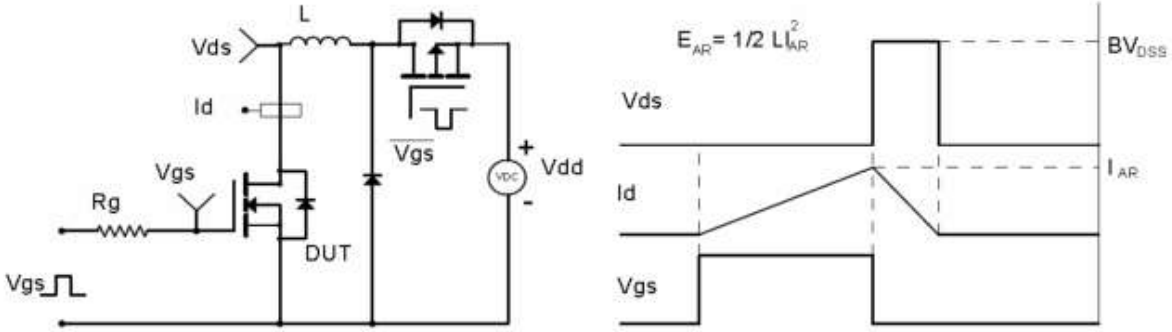
Gate Charge Test Circuit & Waveform



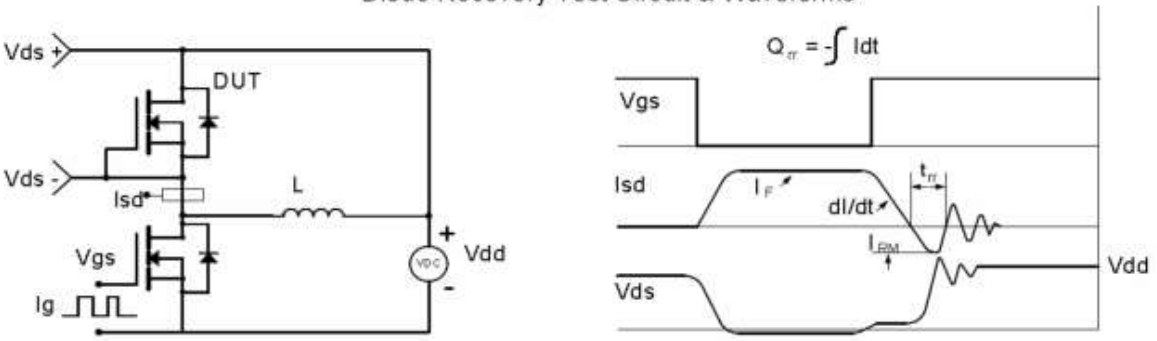
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



RATING AND CHARACTERISTICS CURVES (RM160N40T2)

Fig1. Power Dissipation Derating Curve

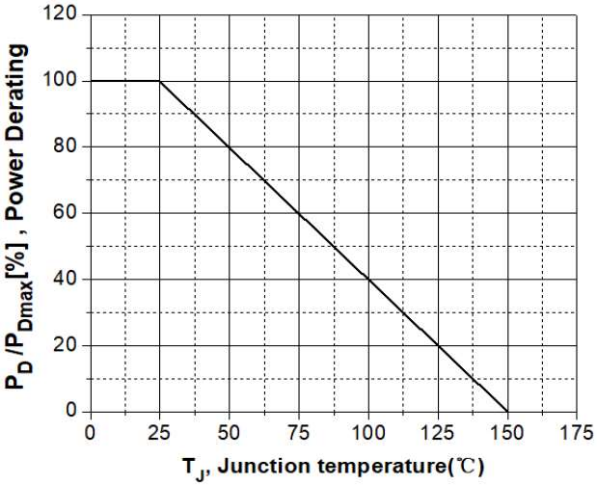


Fig2. Avalanche Energy Derating Curve vs. Junction Temperature

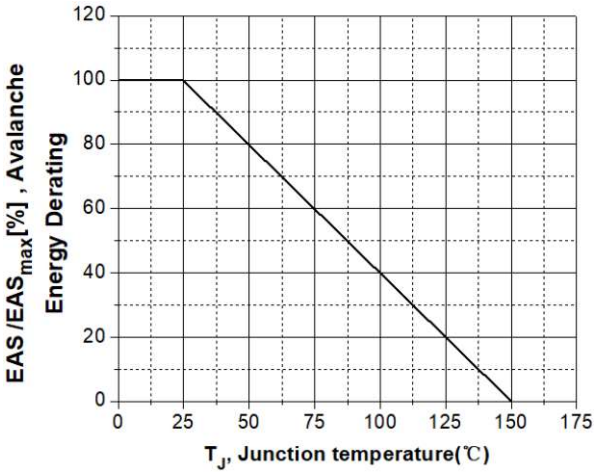


Fig3. Typical Output Characteristics@Tj= 125 ℃

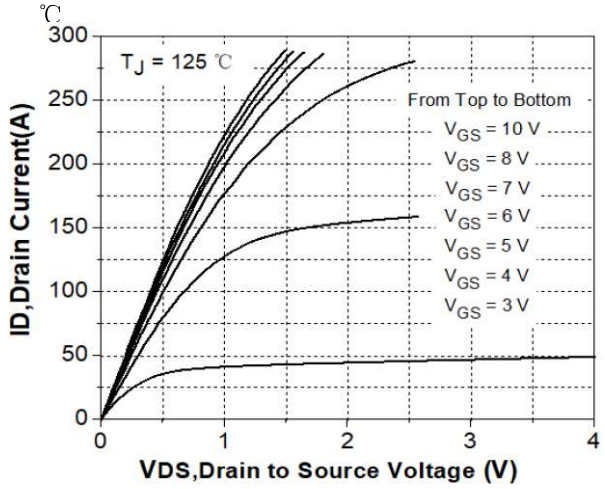


Fig4. Transconductance vs. Drain Current @Tj= -25/25/75/125℃

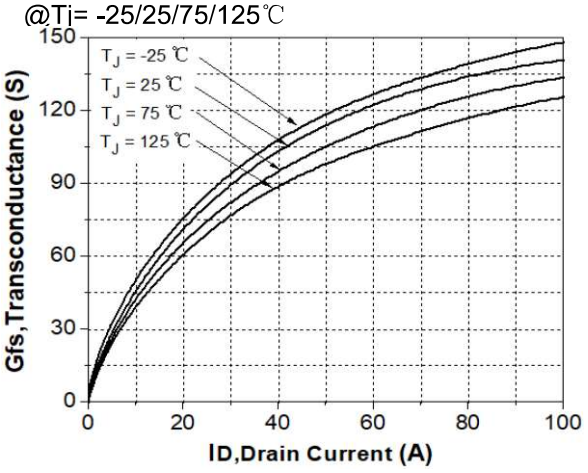


Fig5. Typical Transfer Characteristics @Ti= -25/25/75/125℃

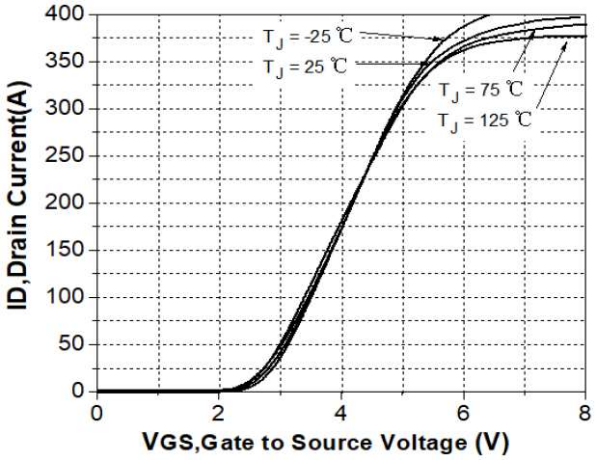
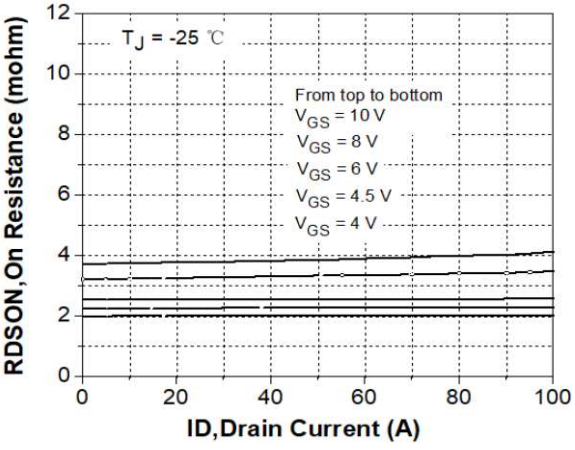


Fig6. Static Drain - Source On - State Resistance vs. Drain Current @Ti= -25℃



RATING AND CHARACTERISTICS CURVES (RM160N40T2)

Fig7. Static Drain - Source On - State Resistance vs. Drain Current @Tj= 25℃

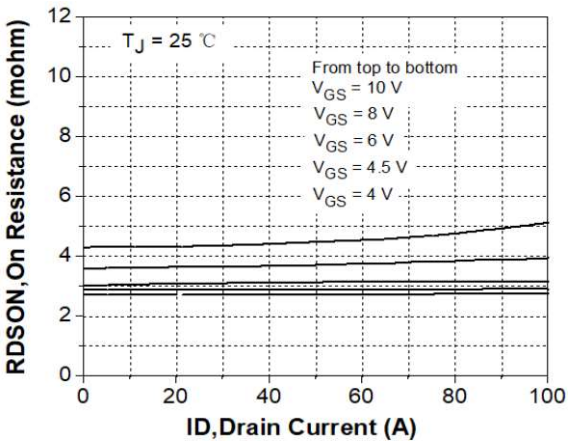


Fig8. Static Drain - Source On - State Resistance vs. Drain Current @Tj= 75℃

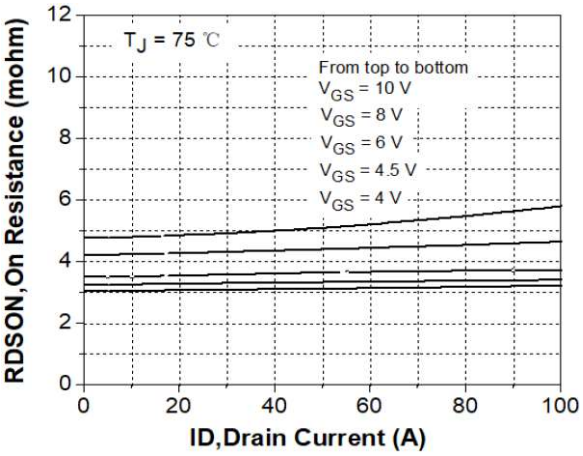


Fig9. Static Drain - Source On - State Resistance vs. Drain Current @Ti= 125℃

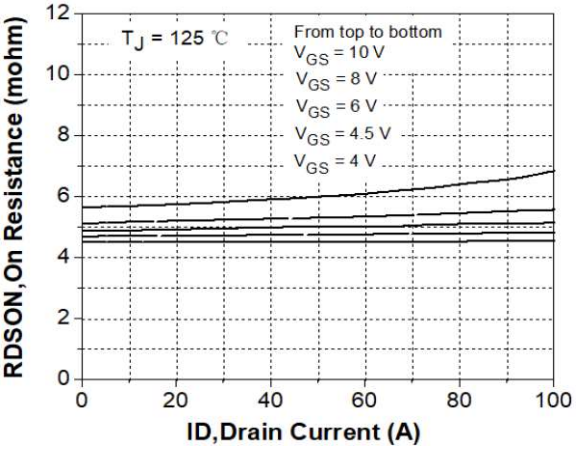


Fig10. Gate Charge Characteristics

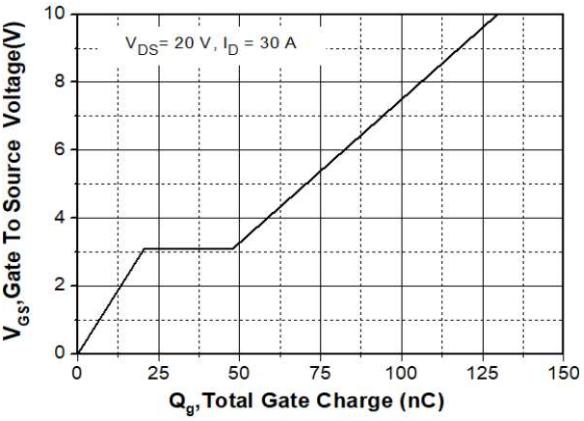


Fig11. Breakdown Voltage vs. Junction Temperature

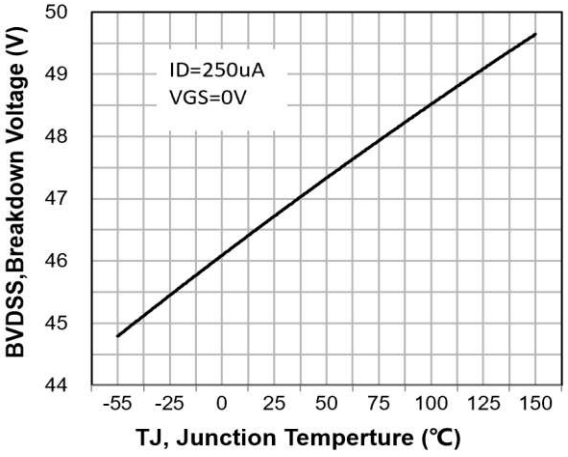
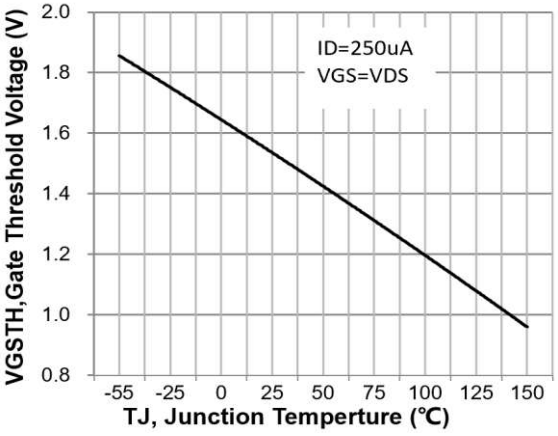


Fig12. Gate Threshold Voltage vs. Junction Temperature



RATING AND CHARACTERISTICS CURVES (RM160N40T2)

Fig13. Safe Operating Area

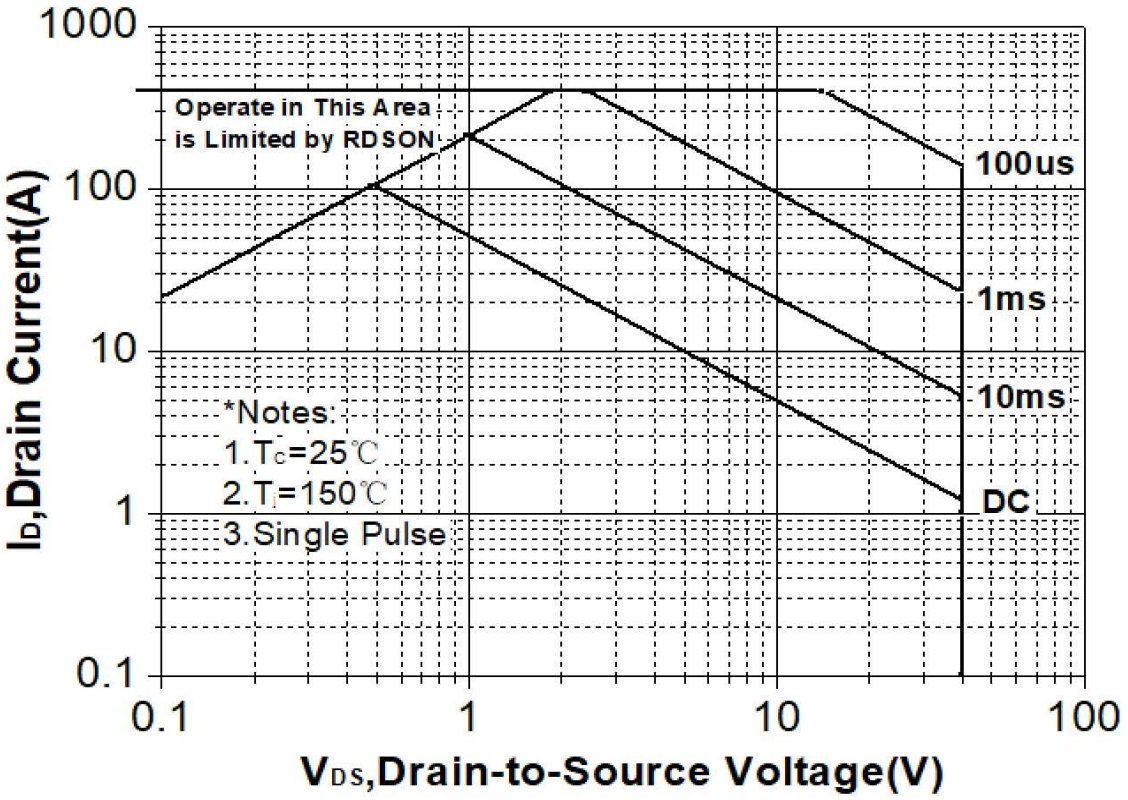
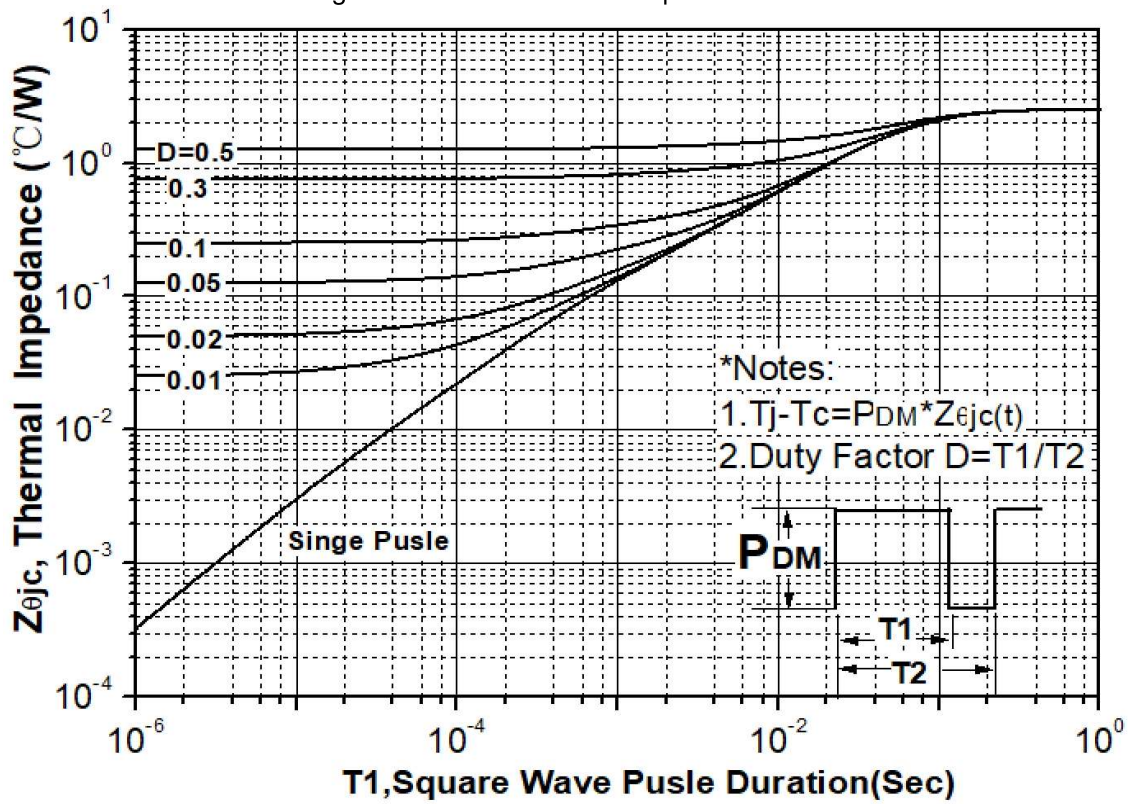


Fig14. Transient Thermal Response Curve



RATING AND CHARACTERISTICS CURVES (RM160N40T2)

Fig15. On-Resistance Variation vs. Junction

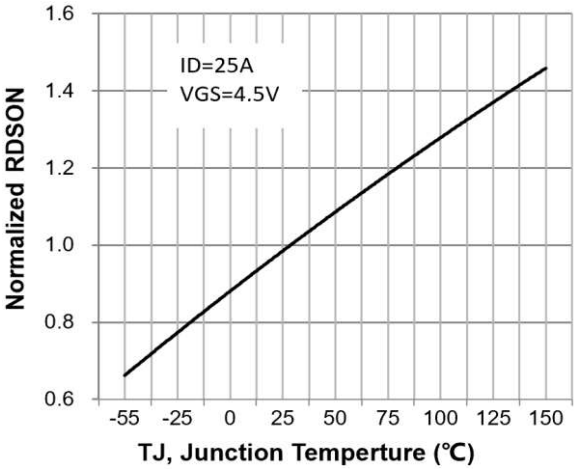


Fig16. Maximum Drain Current vs. Case Temperature

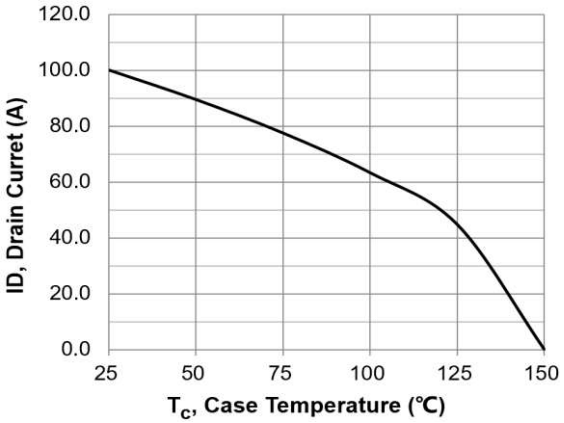


Fig17. Body Diode Forward Voltage vs. Reverse Drain Current

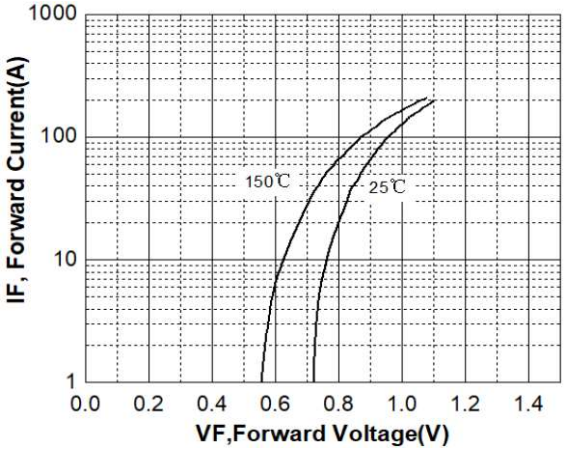
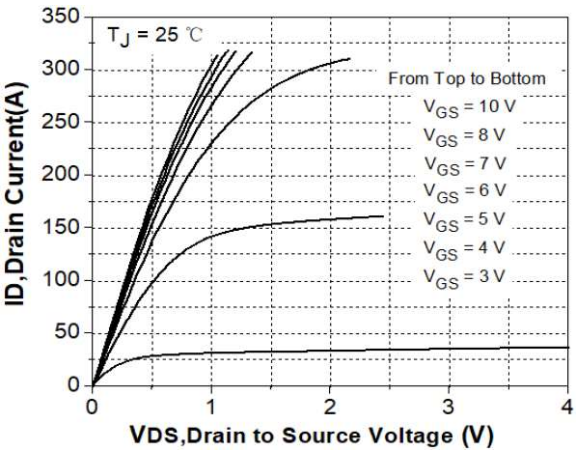
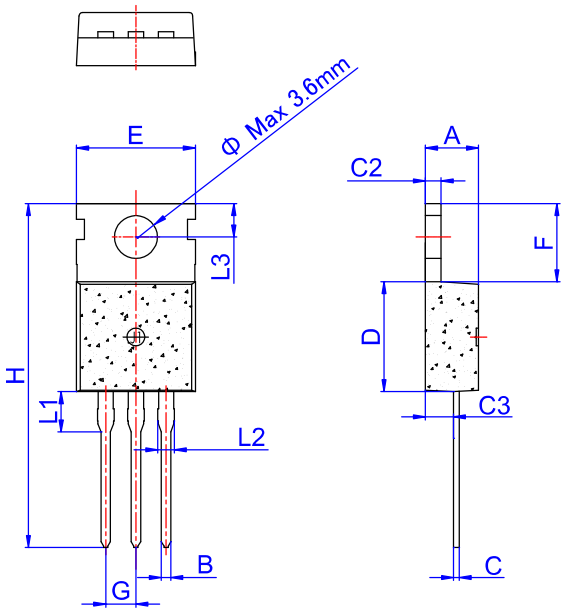


Fig18. Typical Output Characteristics@Tj= 25℃



TO-220C Package Information



TO-220C

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	0.70		0.90	0.028		0.035
C	0.45		0.60	0.018		0.024
C2	1.23		1.32	0.048		0.052
C3	2.20		2.60	0.087		0.102
D	8.90		9.90	0.350		0.390
E	9.90		10.3	0.390		0.406
F	6.30		6.90	0.248		0.272
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1		3.39			0.133	
L2	1.14		1.70	0.045		0.067
L3	2.65		2.95	0.104		0.116
Φ		3.6			0.142	

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