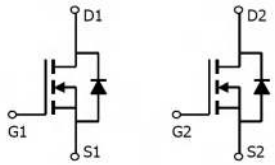
RECTRON SEMICONDUCTOR
TECHNICAL SPECIFICATION

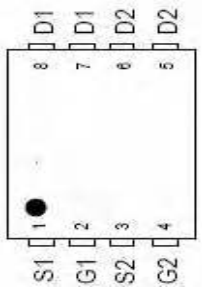
RMD40N60DFV

Dual N-Channel Shielding-Gate Mosfet

Feature

- 60V,40A
  $R_{DS(ON)}$ <14.5mΩ @V_{GS}=10V (TYP:11.5mΩ)
  $R_{DS(ON)}$ <17.5mΩ @V_{GS}=4.5V (TYP:14.5mΩ)
- Split Gate Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Tjmax=175℃





pin assignment

Application

- PWM applications
- Load Switch
- Power management
- P/N suffix V means AEC-Q101 qualified, e.g:RMD40N60DFV
- Halogen-free

Package Marking and Ordering Information

Device Marking	Device	Package	Packaging Code	Reel Size	Quantity(Pcs)	Carton(Pcs)
D40N60	RMD40N60DFV	DFN5X6	-W	13inch	5000	80000

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (T_C=25℃)	I_D	40	A
Continuous Drain Current (T_C=100℃)	I_D	27	A
Pulsed Drain Current (1)	I_{DM}	180	A
Single Pulsed Avalanche Energy (2)	E_{AS}	36	mJ
Power Dissipation	P_D	60	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	2.5	℃/W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	62.5	℃/W
Junction Temperature	T_J	175	℃
Storage Temperature	T_{STG}	-55~ +175	℃

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	60	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =60V, 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	1.2	1.6	2.2	V
Drain-source on-resistance(3)	$R_{DS(on)}$	V_{GS} =10V, I_D =20A	-	11.5	14.5	mΩ
		V_{GS} =4.5V, I_D =10A	-	14.5	17.5	mΩ
Forward Threshold Voltage	g_{fs}	V_{DS} =5V, I_D =20A	-	60	-	S
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =25V, V_{GS} =0V, f =1MHz	-	1000	-	pF
Output Capacitance	C_{oss}		-	220	-	
Reverse Transfer Capacitance	C_{rss}		-	9	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=30V, I_D=20A, V_{GS}=10V, R_G=1.6Ω	-	4.5	-	ns
Turn-on rise time	t_r		-	2.7	-	
Turn-off delay time	$t_{d(off)}$		-	13.5	-	
Turn-off fall time	t_f		-	2.7	-	
Total Gate Charge	Qg	VDS=30V, ID=20A, VGS=10V	-	22	-	nC
Gate-Source Charge	Qgs		-	4.6	-	
Gate-Drain Charge	Qgd		-	3.5	-	
Reverse Recovery Chrage	Qrr	I_F=20A,di/dt=100A/us		12		nC
Reverse Recovery Time	Trr	I_F=20A,di/dt=100A/us		18		ns
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		-	-	40	A

Notes:

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:T_J=25℃,V_{DD}=30V,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

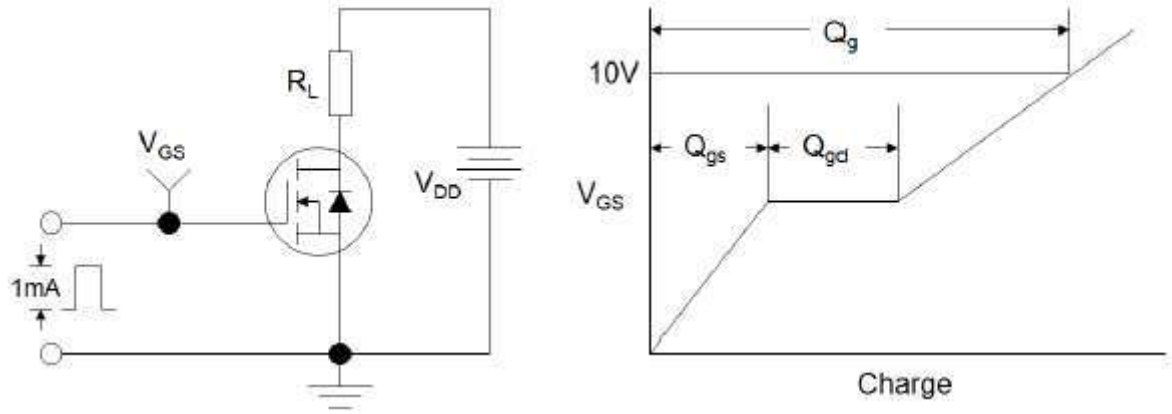


Figure1:Gate Charge Test Circuit & Waveform

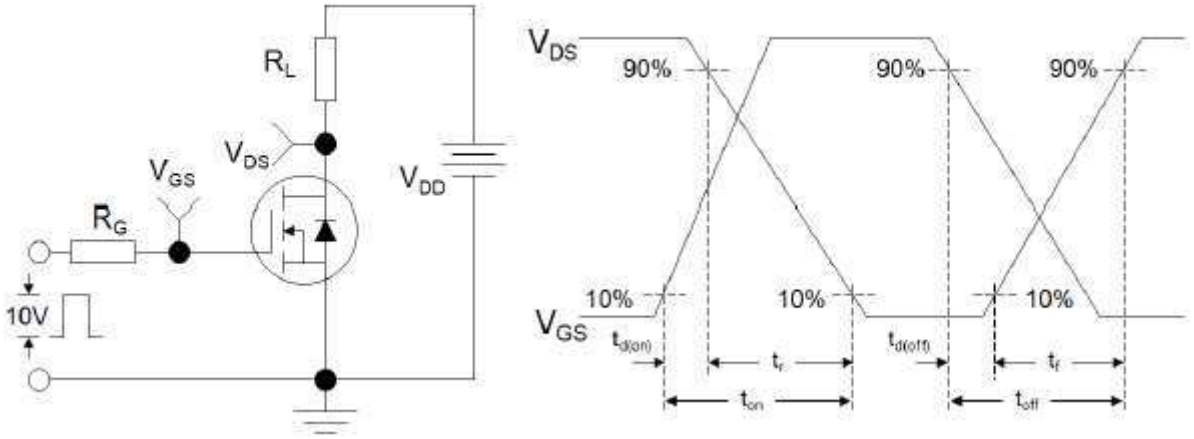


Figure 2: Resistive Switching Test Circuit & Waveforms

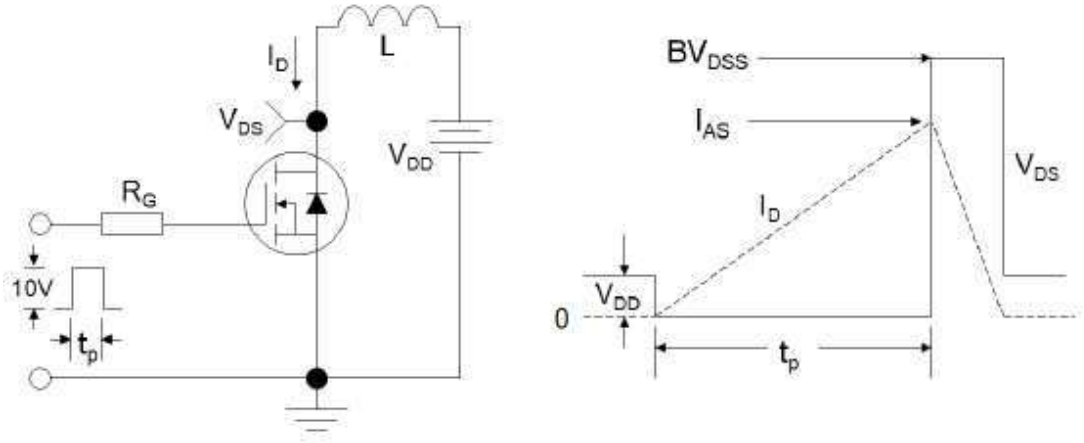


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

RATING AND CHARACTERISTICS CURVES (RMD40N60DFV)

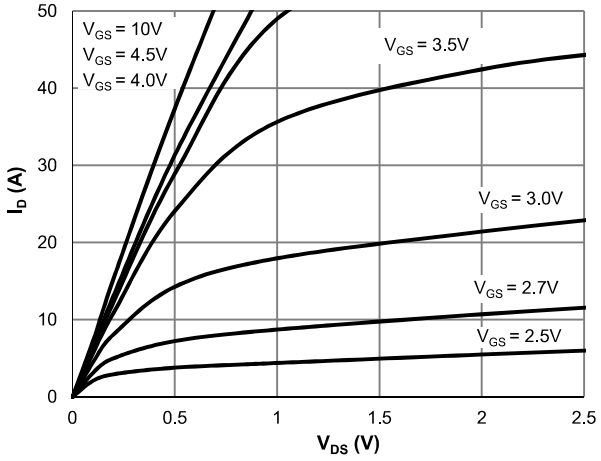


Figure 1: Saturation Characteristics

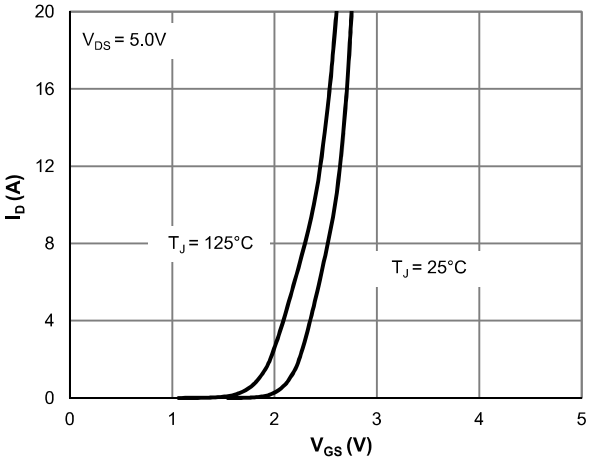


Figure 2: Transfer Characteristics

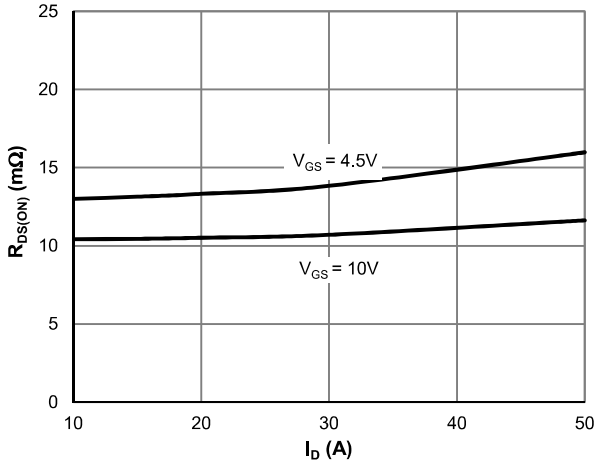


Figure 3: $R_{DS(ON)}$ vs. Drain Current

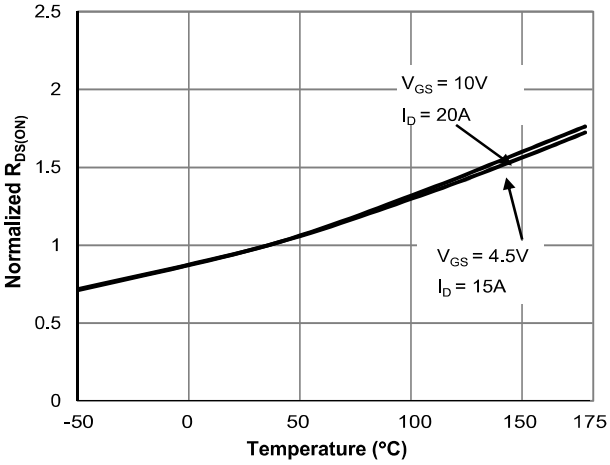


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

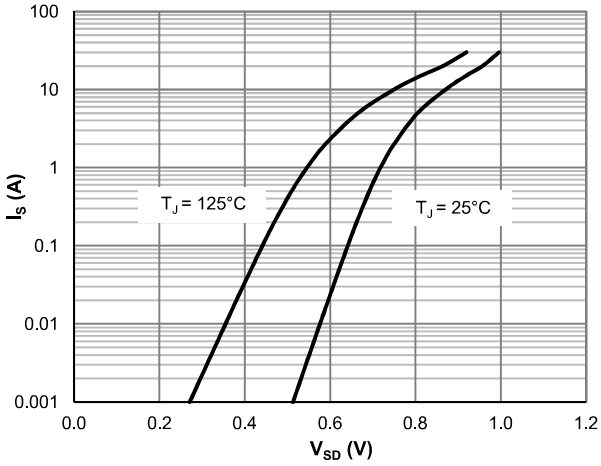


Figure 5: Body-Diode Characteristics

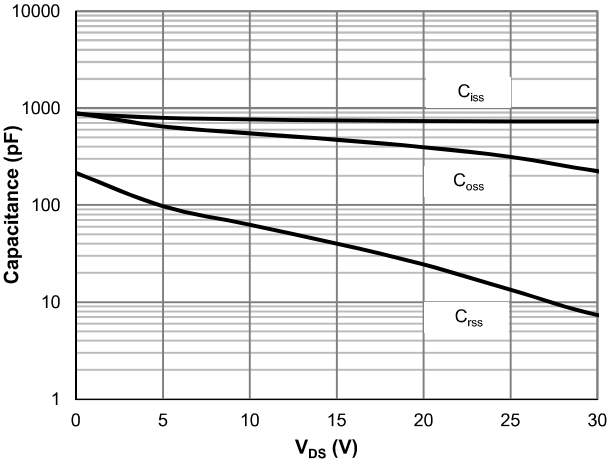


Figure 6: Capacitance Characteristics

RATING AND CHARACTERISTICS CURVES (RMD40N60DFV)

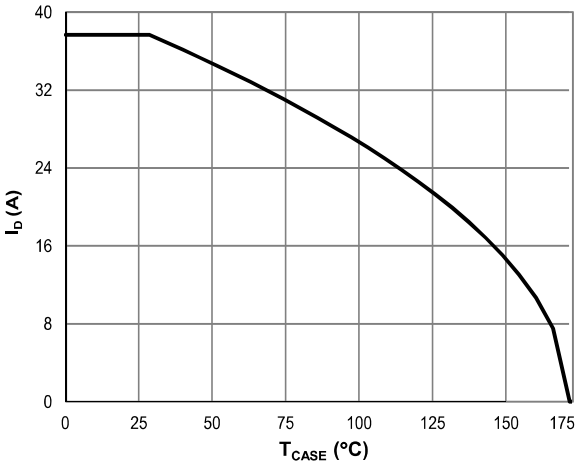


Figure 7: Current De-rating

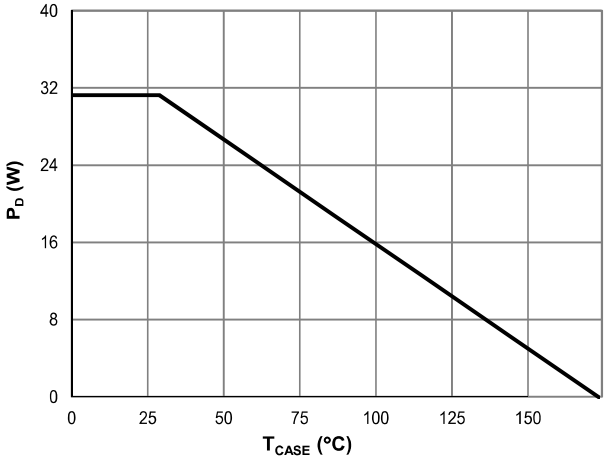


Figure 8: Power De-rating

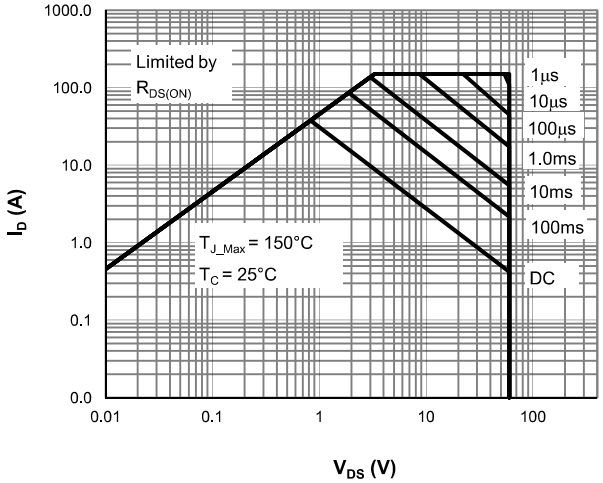


Figure 9: Maximum Safe Operating Area

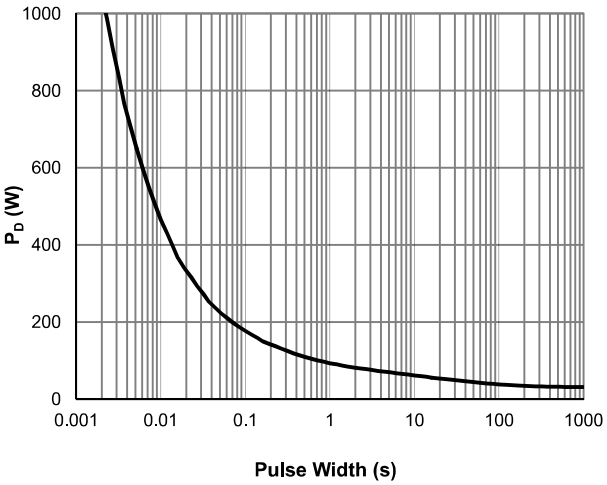


Figure 10: Single Pulse Power Rating, Junction-to-Case

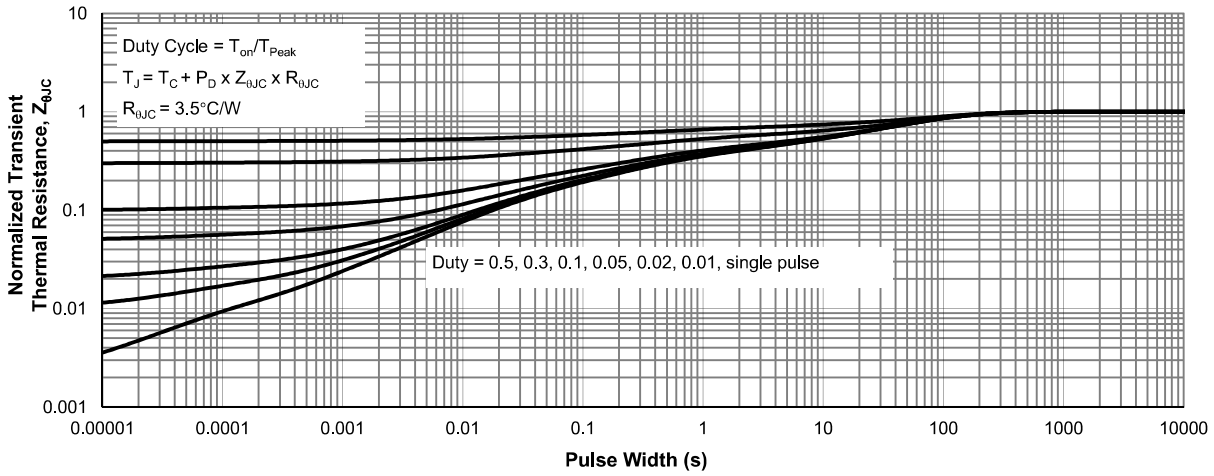
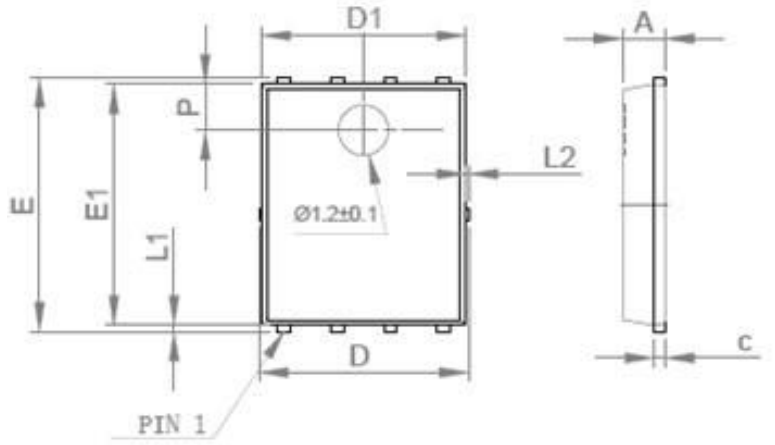
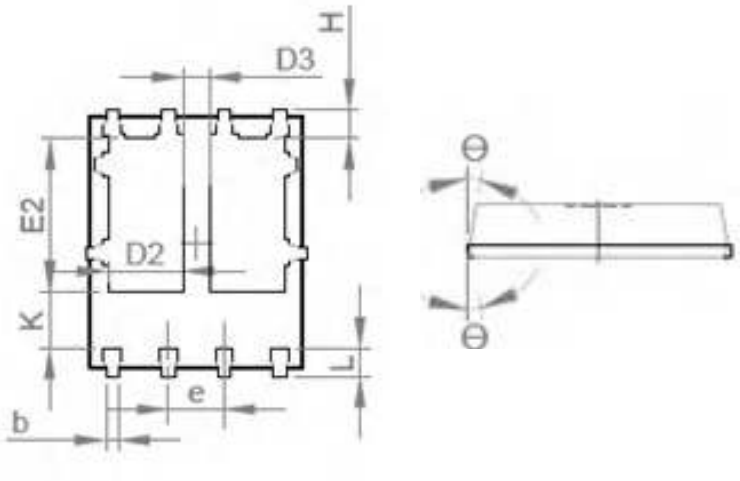


Figure 11: Normalized Maximum Transient Thermal Impedance

Package Mechanical Data





COMMON DIMENSIONS

(UNITS OF MEASURE = MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.90	1.00	1.10
b	0.25	0.30	0.35
c	0.21	0.25	0.34
D	–	–	5.10
D1	4.80	4.90	5.00
D2	1.605	1.705	1.805
D3	0.55	0.60	0.65
e	1.27 BSC		
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.375	3.475	4.475
H	0.55	0.65	0.75
K	1.20	–	–
L	0.60	0.65	0.70
L1	0.05	0.15	0.25
L2	–	–	0.12
Θ	8°	10°	12°
P	1.00	1.10	1.20

RECTRON

Marking on the body

Rectron Logo →  Y Y W W

Year – Code
(Y:26-----2026
27-----2027.....)

Week – code
(WW:01~52)

D 4 0 N 6 0 ← Part No.

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