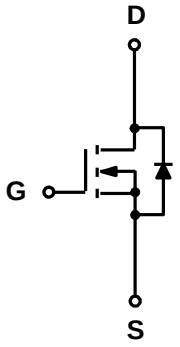
RECTRON SEMICONDUCTOR
TECHNICAL SPECIFICATION

RM40N100HDV

N-Channel Enhancement Mosfet

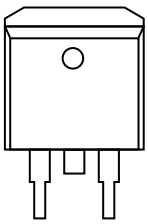
Feature

- 100V,40A
  $R_{DS(ON)}$ <25mΩ @V_{GS}=10V (TYP:18mΩ)
  $R_{DS(ON)}$ <38mΩ @V_{GS}=4.5V (TYP:25mΩ)
- Split Gate Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge



Application

- PWM applications
- Load Switch
- Power management
- Halogen-free
- P/N suffix V means AEC-Q101 qualified, e.g:RM40N100HDV



TO-263

Package Marking and Ordering Information

Device	Device Marking	Device Package	Reel Size	Tape width	Quantity (PCS)
RM40N100HDV	40N100	TO-263	-	-	800

ABSOLUTE MAXIMUM RATINGS (T_a=25℃ 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_a =25℃)	I_D	40	A
Continuous Drain Current (T_a =100℃)	I_D	25	A
Pulsed Drain Current (1)	I_{DM}	160	A
Single Pulsed Avalanche Energy (2)	E_{AS}	16	mJ
Power Dissipation	P_D	45	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	2.5	℃/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	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(3)	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1.2	1.8	2.8	V
Drain-source on-resistance(3)	$R_{DS(on)}$	V_{GS} =10V, I_D =15A	-	18	25	mΩ
		V_{GS} =4.5V, I_D =10A	-	25	38	mΩ
Forward Threshold Voltage	g_{fs}	V_{DS} =10V, I_D =20A	-	22	-	S
Gate Resistance	R_g	V_{DS} =V_{GS} =0V, f =1MHz	-	1.62	-	Ω
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =50V, V_{GS} =0V, f =1MHz	-	822	-	pF
Output Capacitance	C_{oss}		-	310	-	
Reverse Transfer Capacitance	C_{rss}		-	23.5	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=50V, I_D=20A, V_{GS}=10V, R_G=3Ω	-	15	-	ns
Turn-on rise time	t_r		-	3.2	-	
Turn-off delay time	$t_{d(off)}$		-	30	-	
Turn-off fall time	t_f		-	7.6	-	
Total Gate Charge	Qg	VDS=50V, ID=20A, VGS=10V	-	22.7	-	nC
Gate-Source Charge	Qgs		-	6.2	-	
Gate-Drain Charge	Qgd		-	5.3	-	
Reverse Recovery Chrage	Qrr	I_F=20A,di/dt=100A/us		59		nC
Reverse Recovery Time	Trr	I_F=20A,di/dt=100A/us		45		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}=50V,R_G=25Ω,L=0.5Mh
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board,t≤10 sec

RATING AND CHARACTERISTICS CURVES (RM40N100HDV)

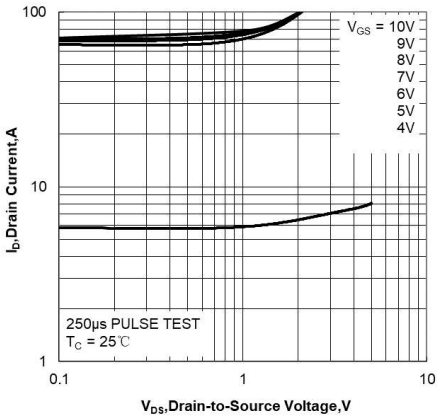


Figure 1. Output Characteristics

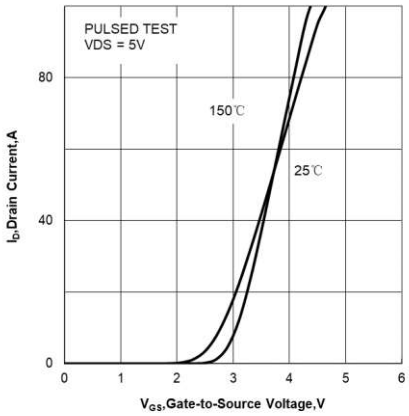


Figure 2. Transfer Characteristics

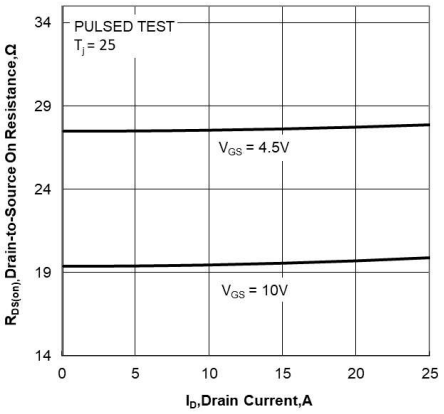


Figure 3. Drain-to-Source On Resistance vs Drain Current

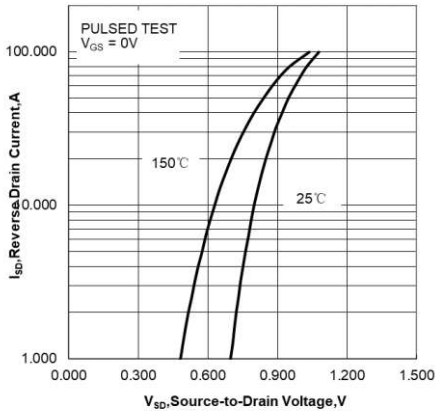


Figure 4. Body Diode Forward Voltage vs Source Current and Temperature

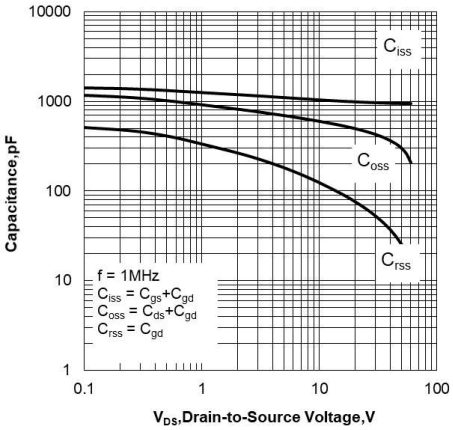


Figure 5. Capacitance Characteristics

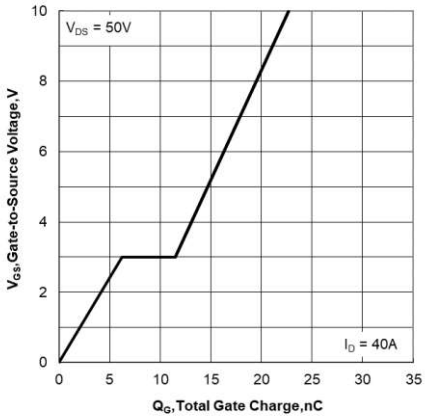


Figure 6. Gate Charge Characteristics

RATING AND CHARACTERISTICS CURVES (RM40N100HDV)

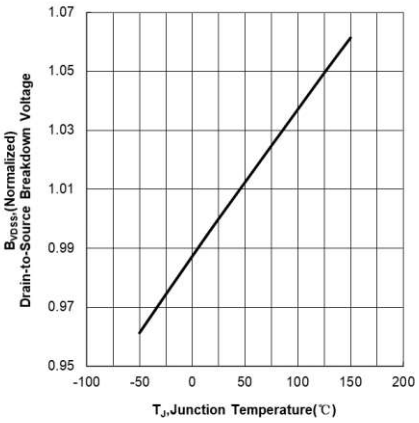


Figure 7. Normalized Breakdown Voltage vs Junction Temperature

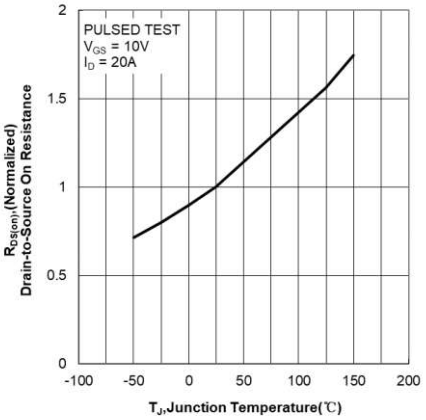


Figure 8. Normalized On Resistance vs Junction Temperature

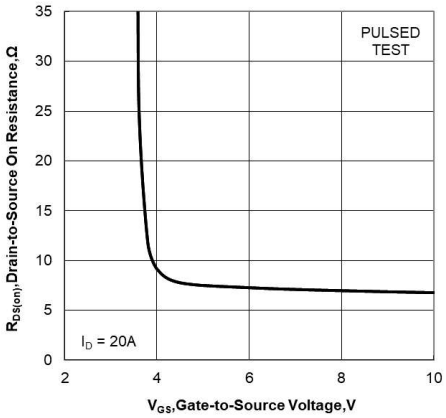


Figure 9. Drain-to-Source On Resistance vs Gate Voltage and Drain Current

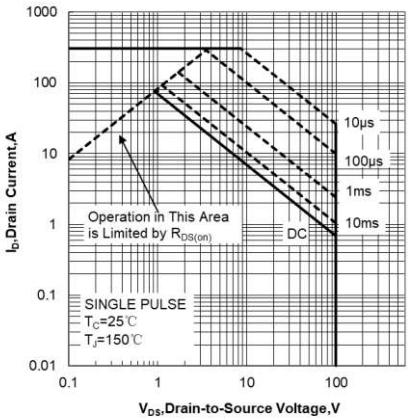


Figure 10. Maximum Safe Operating Area

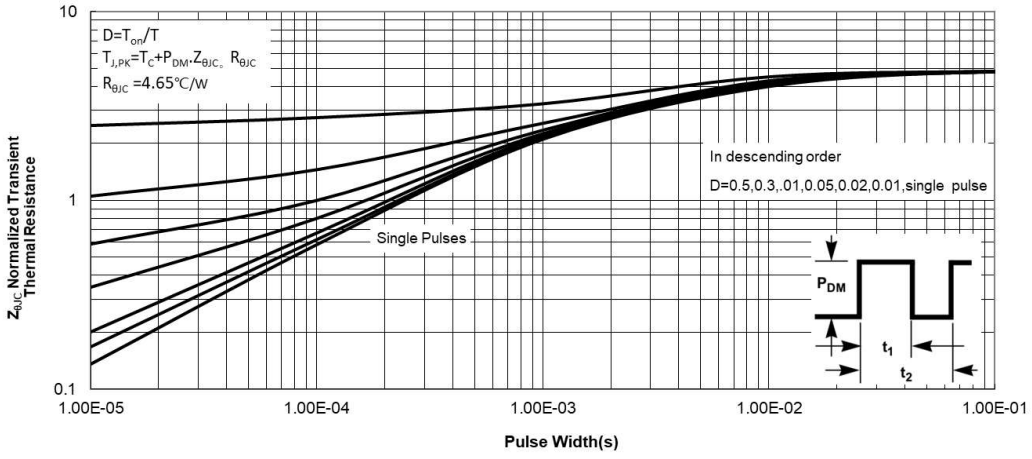
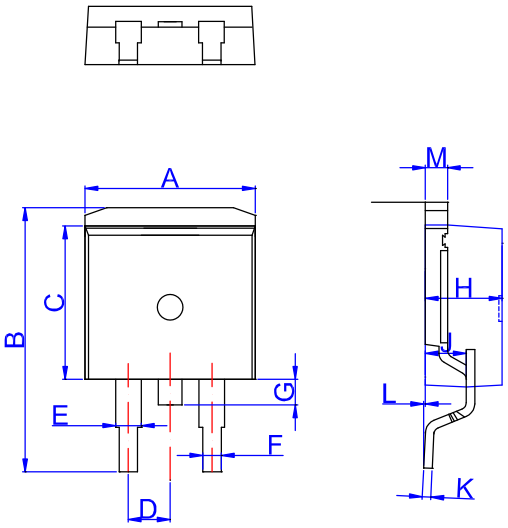


Figure11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

TO 263 Package Information



TO-263

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.90		10.20	0.390		0.402
B	14.70		15.80	0.579		0.622
C	9.4		9.6	0.37		0.378
D		2.54			0.100	
E	1.20		1.40	0.047		0.055
F	0.75		0.85	0.029		0.033
G			1.75			0.069
H	4.40		4.70	0.173		0.185
J	2.30		2.70	0.091		0.106
K	0.38		0.55	0.015		0.022
L	0	0.10	0.25	0	0.004	0.010
M	1.25		1.35	0.049		0.053

DISCLAIMER NOTICE

Rectron Inc reserves the right to make changes without notice to any product specification herein, to make corrections, modifications, enhancements or other changes. Rectron Inc or anyone on its behalf assumes no responsibility or liability for any errors or inaccuracies. Data sheet specifications and its information contained are intended to provide a product description only. "Typical" parameters which may be included on RECTRON data sheets and/ or specifications can and do vary in different applications and actual performance may vary over time. Rectron Inc does not assume any liability arising out of the application or use of any product or circuit.

Rectron products are not designed, intended or authorized for use in medical, life-saving implant or other applications intended for life-sustaining or other related applications where a failure or malfunction of component or circuitry may directly or indirectly cause injury or threaten a life without expressed written approval of Rectron Inc. Customers using or selling Rectron components for use in such applications do so at their own risk and shall agree to fully indemnify Rectron Inc and its subsidiaries harmless against all claims, damages and expenditures.