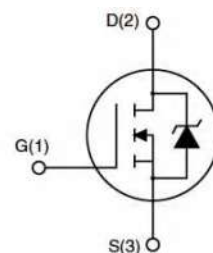


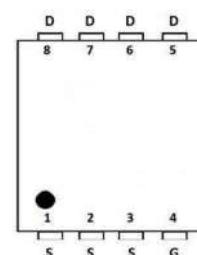
N-Channel Enhancement Mosfet

Feature

- 100V,90A
 $R_{DS(ON)} < 7.7m\Omega @ V_{GS}=10V$ TYP: 6.2m Ω
 $R_{DS(ON)} < 10.0m\Omega @ V_{GS}=4.5V$ TYP: 8.5m Ω
- Split Gate Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- $T_{jmax}=175^{\circ}C$
- P/N suffix V means AEC-Q101 qualified, e.g:RM90N100DFV
- Halogen-free



Schematic Diagram



pin Assignment

Application

- PWM applications
- Load Switch
- Power management

Package Marking and Ordering Information

Device Marking	Device	Package	Packaging Code	Reel Size	Quantity(Pcs)	Carton(Pcs)
90N100	RM90N100DFV	DFN5X6	-W	13inch	5000	80000

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	90	A
Continuous Drain Current ($T_C = 100^{\circ}C$) ⁽¹⁾	I_D	60	A
Pulsed Drain Current ^(1,3)	I_{DM}	360	A
Single Pulsed Avalanche Energy ($V_{DD} = 50V, L = 0.5mH$)	E_{AS}	225	mJ
Drain Power Dissipation	P_D	100	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	1.5	$^{\circ}C/W$
Thermal Resistance- Junction to Ambient ⁽³⁾	$R_{\theta JA}$	48	$^{\circ}C/W$
Junction Temperature	T_J	175	$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +175	$^{\circ}C$

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

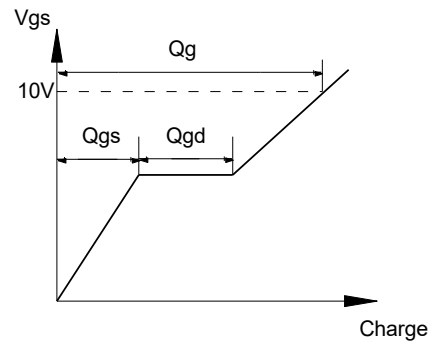
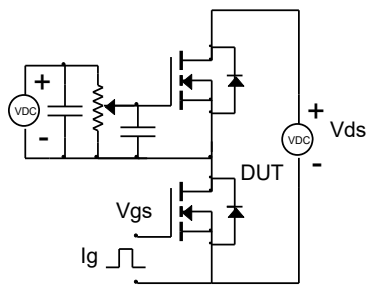
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	100	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =100V, V _{GS} = 0V	-	-	1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ± 20V, V _{DS} = 0V	-	-	±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.5	2.0	3.0	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =40A	-	6.2	7.7	mΩ
		V _{GS} =4.5V, I _D =40A	-	8.5	10	mΩ
Forward Threshold Voltage	g _{fs}	V _{DS} =10V, I _D =40A	-	65	-	S
Gate Resistance	R _g	V _{DS} =V _{GS} =0V, f =1MHz	-	1.3	-	Ω
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f =1.0MHz	-	3000	-	pF
Output Capacitance	C _{oss}		-	362	-	
Reverse Transfer Capacitance	C _{rss}		-	11	-	
Switching characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} =50V, I _D =40A, R _G =3Ω, R _L =1.5Ω,V _G =10V	-	13	-	ns
Turn-on rise time	t _r		-	35	-	
Turn-off delay time	t _{d(off)}		-	20	-	
Turn-off fall time	t _f		-	15	-	
Total Gate Charge	Q _g	V _{DS} =50V, I _D =40A, V _{GS} =10V	-	30	-	nC
Gate-Source Charge	Q _{gs}		-	10	-	
Gate-Drain Charge	Q _{gd}		-	8	-	
Source-Drain Diode characteristics						
Diode Forward voltage	V _{SD}	T _J =25℃, V _{GS} =0V, I _S =20A	-	-	1.3	V
Diode Forward current	I _S	T _C =25℃	-	-	90	A
Body Diode Reverse Recovery Time	trr	T _J =25℃ , IF=20A,di/dt=100A/us		60		ns
Body Diode Reverse Recovery Charge	Qrr	T _J =25℃ , IF=20A,di/dt=100A/us		90		uc

Notes:

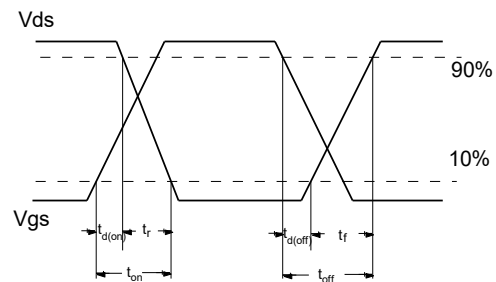
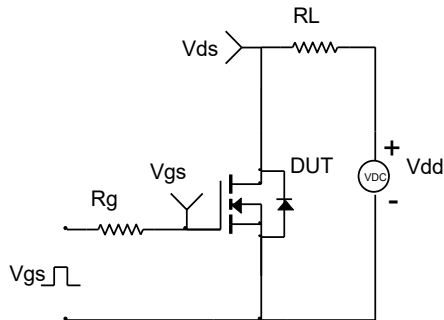
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: $T_J = 25^{\circ}\text{C}, V_{DD} = 50V, V_G = 10V, I_{AS} = 30A, R_G = 25\Omega, L = 0.5mH$
3. The value of $R_{\theta JA}$ Mounted on FR4 Board (25.4mm*25.4mm*t1.6mm) With 2oz Copper, $T_a = 25^{\circ}\text{C}$

Test Circuit

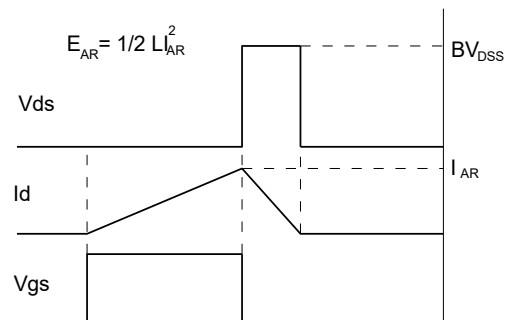
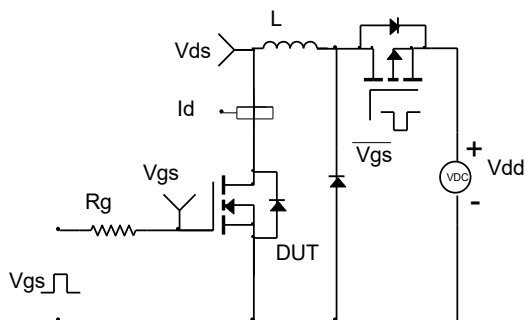
Gate Charge Test Circuit & Waveform



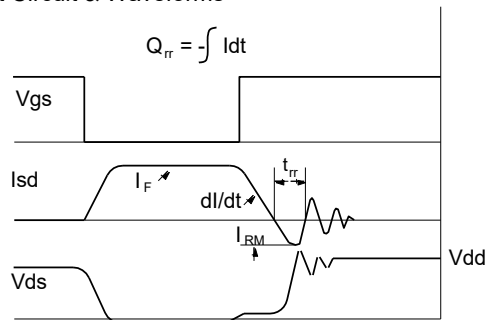
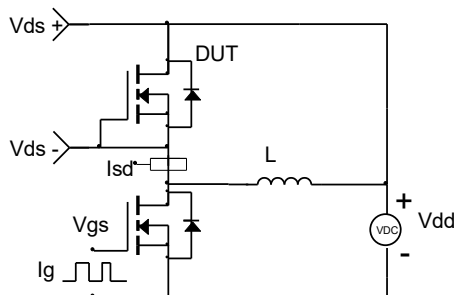
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



RATING AND CHARACTERISTICS CURVES (RM90N100DFV)

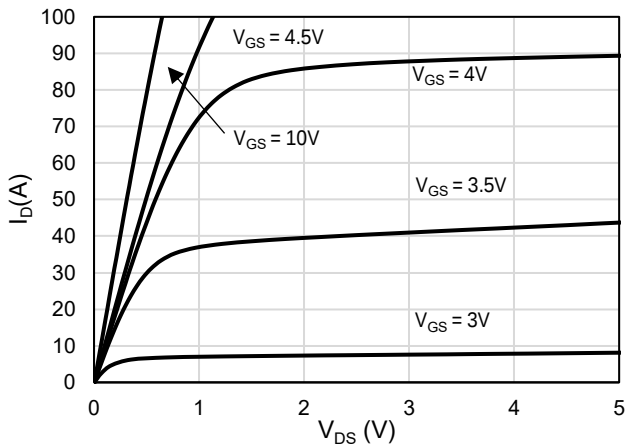


Figure 1: On-Region Characteristics

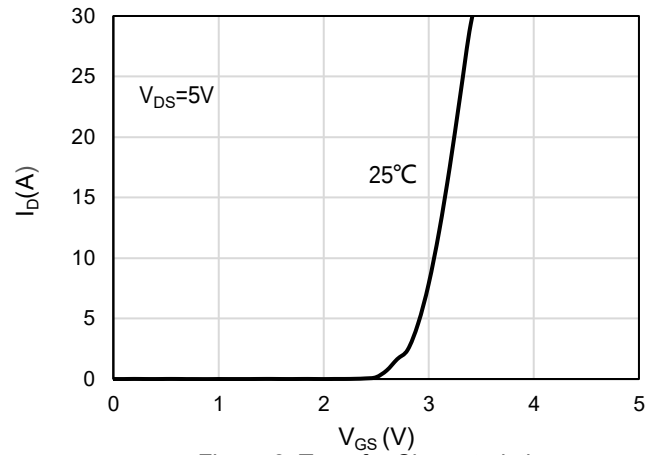


Figure 2: Transfer Characteristics

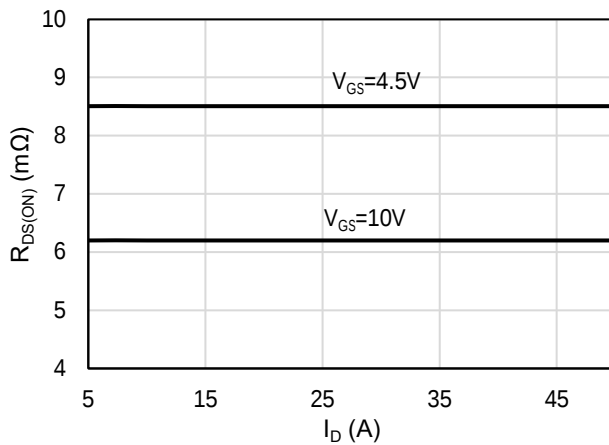


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

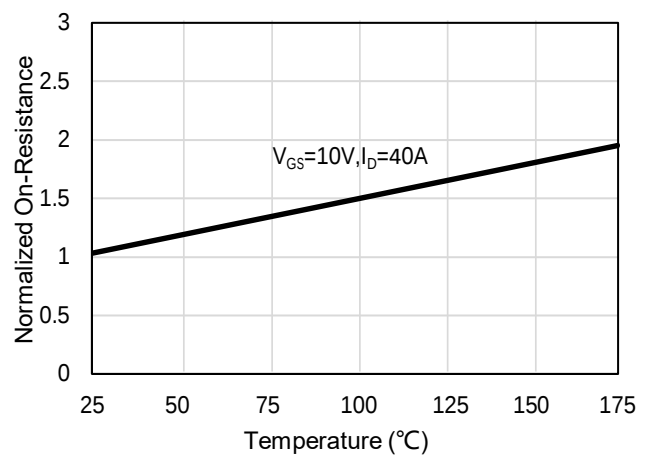


Figure 4: On-Resistance vs. Junction Temperature

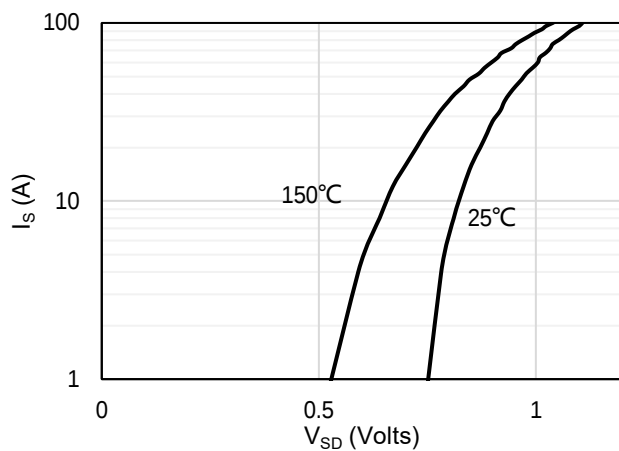


Figure 5: Body-Diode Characteristics

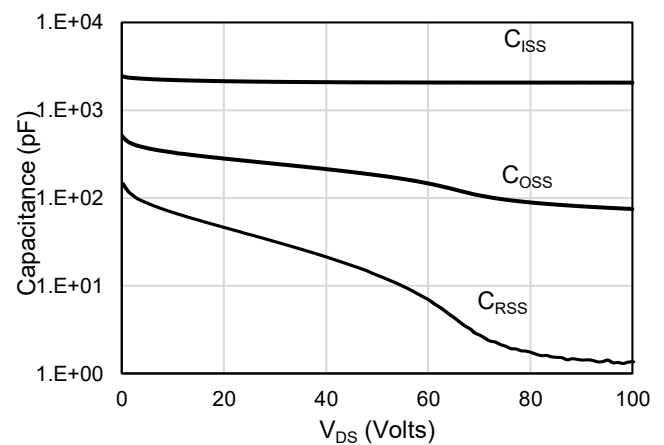
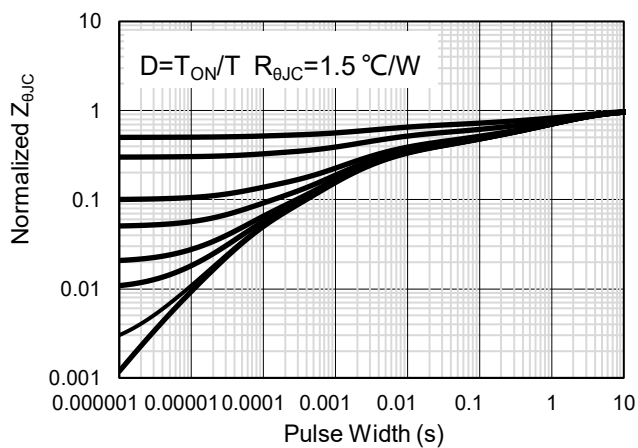
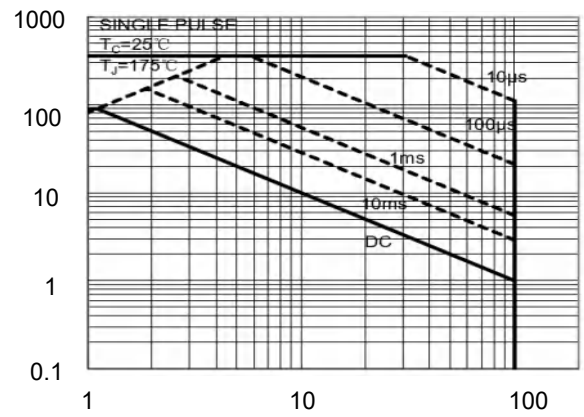
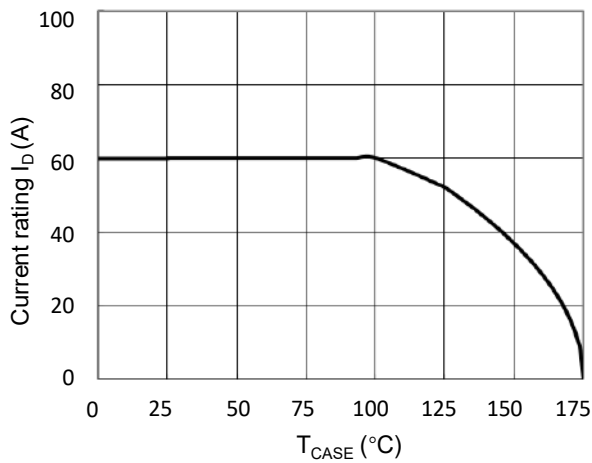
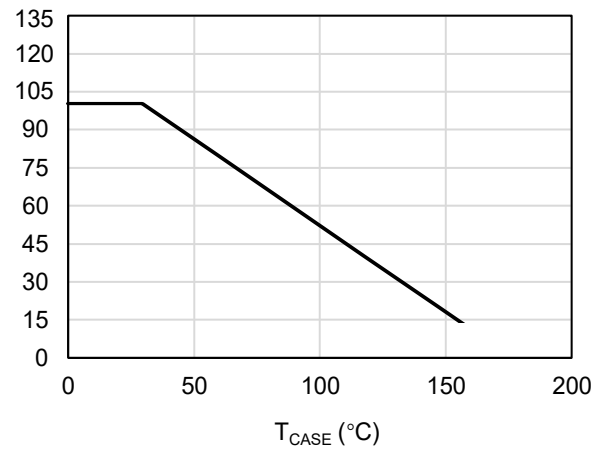
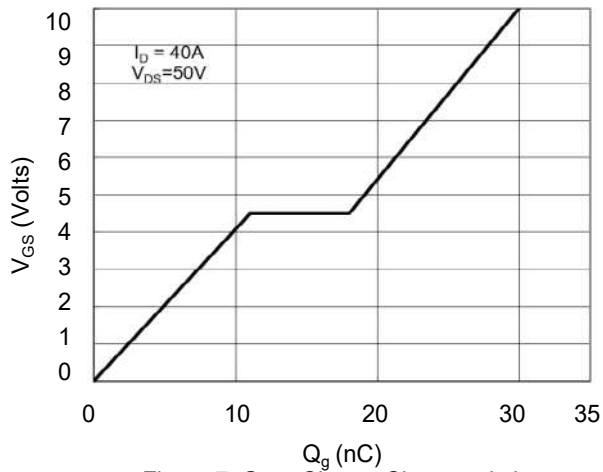


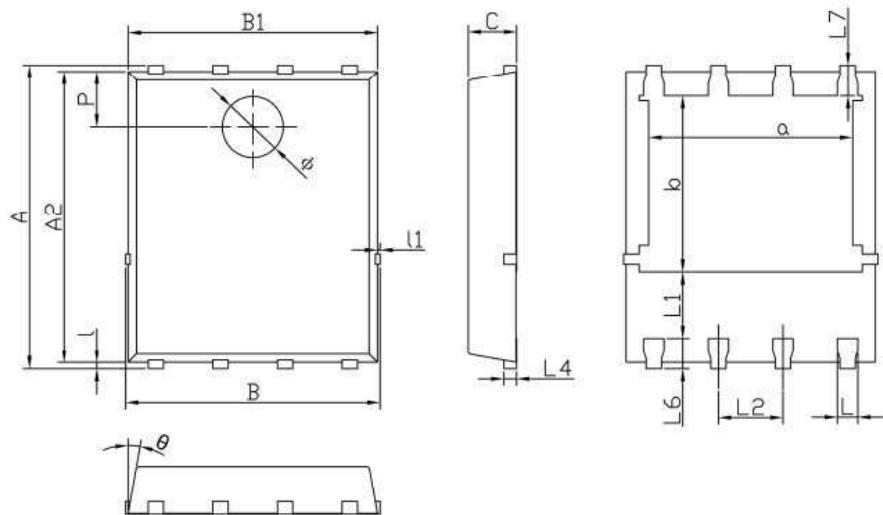
Figure 6: Capacitance Characteristics

RATING AND CHARACTERISTICS CURVES (RM90N100DFV)



DFN5X6 Package Information

Unit:mm

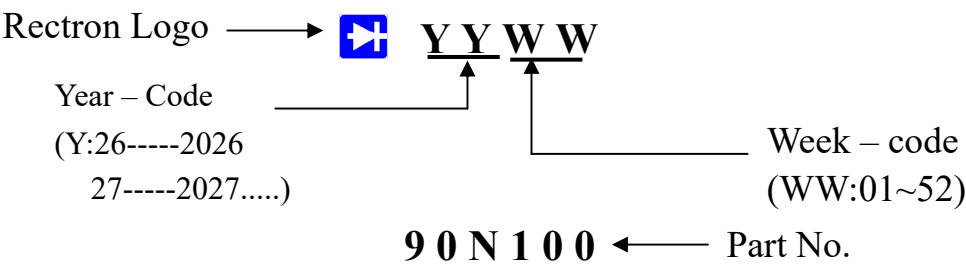


Dimensions In Millimeter			
Symbol	MIN	TYP	MAX
A	5.90	6.00	6.10
a	3.91	4.01	4.11
A2	5.70	5.75	5.80
B	4.90	5.00	5.10
b	3.37	3.47	3.57
B1	4.80	4.90	5.00
C	0.90	0.95	1.00
L	0.35	0.40	0.45
l	0.06	0.13	0.20
L1	1.10	-	-
l1	-	-	0.10
L2	1.17	1.27	1.37
L4	0.21	0.26	0.34
L6	0.51	0.61	0.71
L7	0.51	0.61	0.71
P	1.00	1.10	1.20
θ	8°	10°	12°
ϕ	1.10	1.20	1.30



RECTRON

Marking on the body



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.