

RC150N03D5

N-Channel Enhancement Mode Field Effect Transistor

Product Summary

- V_{DS} 30 V
- I_D 150 A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) <2.4 mohm
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) <3.2 mohm
- 100% UIS Tested
- 100% ∇V_{DS} Tested

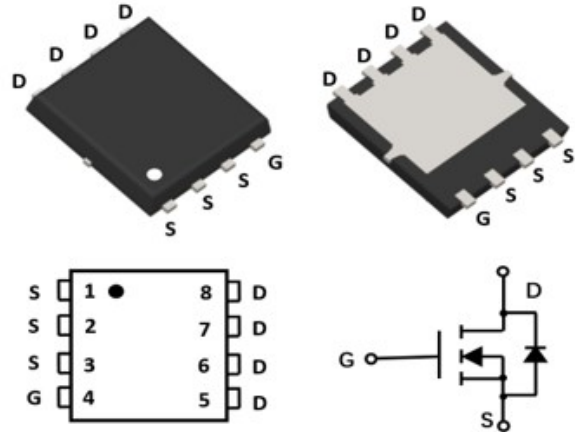
General Description

- Trench Power MV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

Applications

- DC-DC Converters
- Power management functions
- Backlighting

PDFN 5X6



■ Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	30	V
Gate-source Voltage	V_{GS}	± 20	V
Drain Current	I_D	$T_C=25^\circ\text{C}$	150
		$T_C=100^\circ\text{C}$	95
Pulsed Drain Current ^A	I_{DM}	300	A
Total Power Dissipation @ $T_C=25^\circ\text{C}$ ^B	P_D	83	W
Total Power Dissipation @ $T_C=100^\circ\text{C}$ ^B	P_D	33	W
Total Power Dissipation @ $T_A=25^\circ\text{C}$ ^C	P_D	7.4	W
Single Pulse Avalanche Energy ^D	E_{AS}	400	mJ
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1.5	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction-to-Ambient	$R_{\theta JA}$	17	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	T_J, T_{STG}	-55~+150	$^\circ\text{C}$

■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
RC150N03D5	F1	150N03	5000	10000	100000	13" reel



■ Electrical Characteristics (T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250μA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, 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	1.0	1.5	2.5	V
Static Drain-Source On Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D =20A		1.58	2.4	mΩ
		V _{GS} = 4.5V, I _D =20A		2.2	3.3	
Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V		0.85	1.2	V
Maximum Body-Diode Continuous Current	I _S				150	A
Gate resistance	R _g	f=1 MHz, Open drain		2.9		Ω
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=1MHZ		4498		pF
Output Capacitance	C _{oss}			800		
Reverse Transfer Capacitance	C _{rss}			643		
Switching Parameters						
Total Gate Charge	Q _g (10V)	V _{GS} =10V, V _{DS} =15V, I _D =20A		92.7		nC
Total Gate Charge	Q _g (4.5V)			46		
Gate-Source Charge	Q _{gs}			13.5		
Gate-Drain Charge	Q _{gd}			22.8		
Reverse Recovery Charge	Q _{rr}	I _F =20A, di/dt=500A/us		3.0		ns
Reverse Recovery Time	t _{rr}			15		
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =20V, I _D =4A, R _L =0.75Ω R _{GEN} =3Ω		11		ns
Turn-on Rise Time	t _r			80		
Turn-off Delay Time	t _{D(off)}			39		
Turn-off fall Time	t _f			92		

A. Pulse Test: Pulse Width ≤ 300us, Duty cycle ≤ 2%.

B. The power dissipation P_D is based on T_{J(MAX)}=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C. The value of R_{θJA} is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C.

D. T_J=25°C, V_{DD}=20V, V_G=10V, L=2.0mH, R_g=25Ω.



■ Typical Performance Characteristics

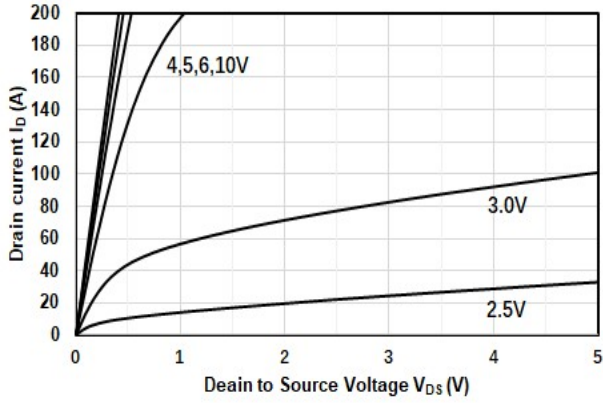


Figure1. Output Characteristics

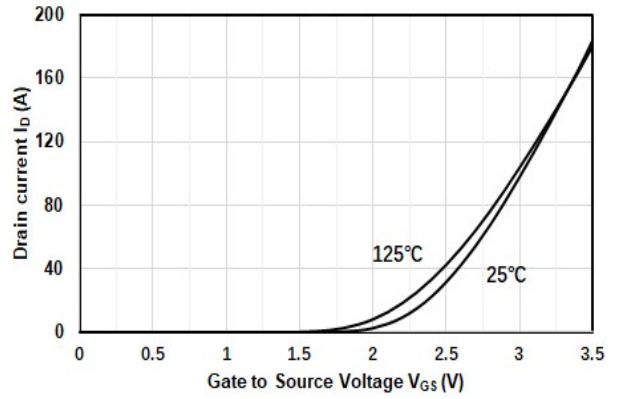


Figure2. Transfer Characteristics

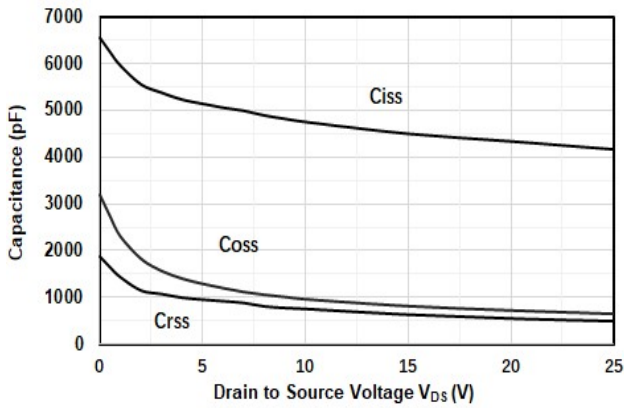


Figure3. Capacitance Characteristics

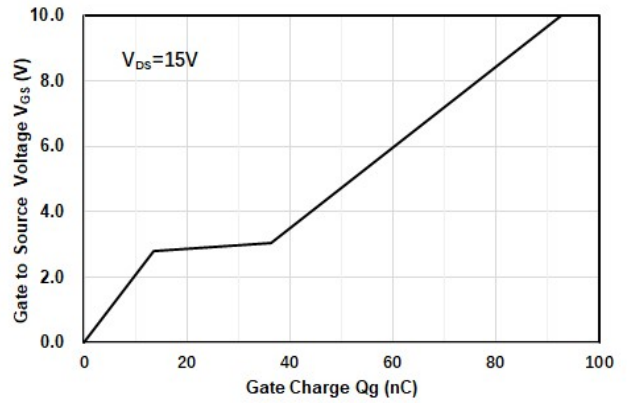


Figure4. Gate Charge

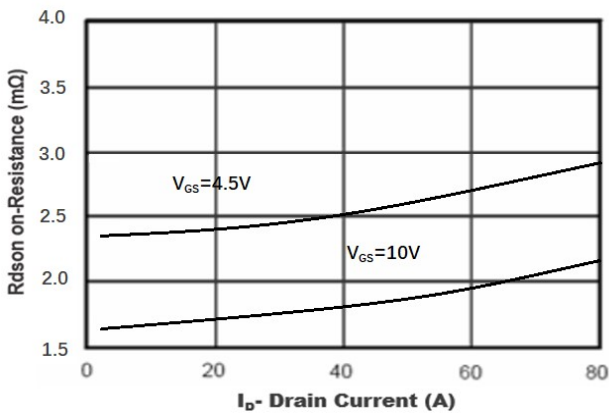


Figure5. Drain-Source on Resistance

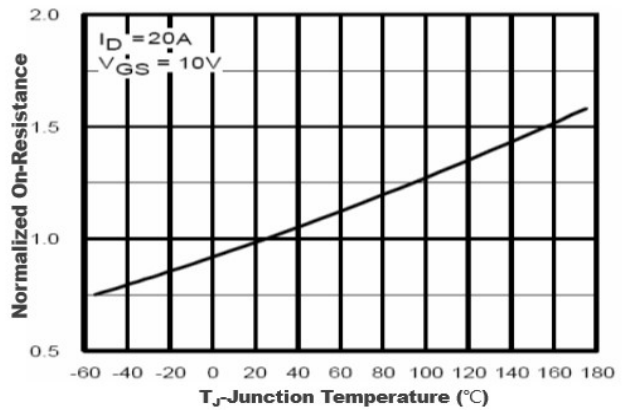


Figure6. Drain-Source on Resistance

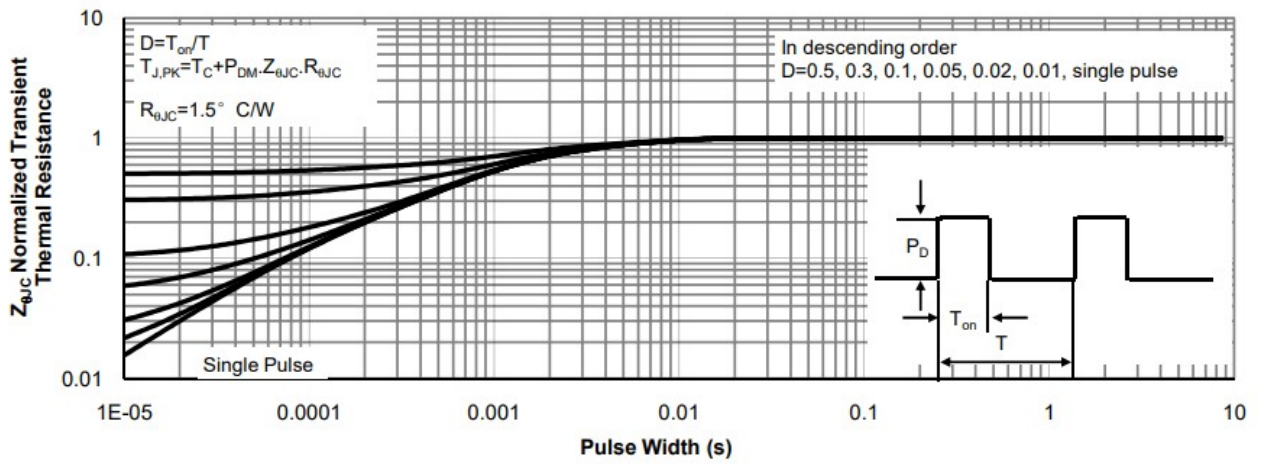
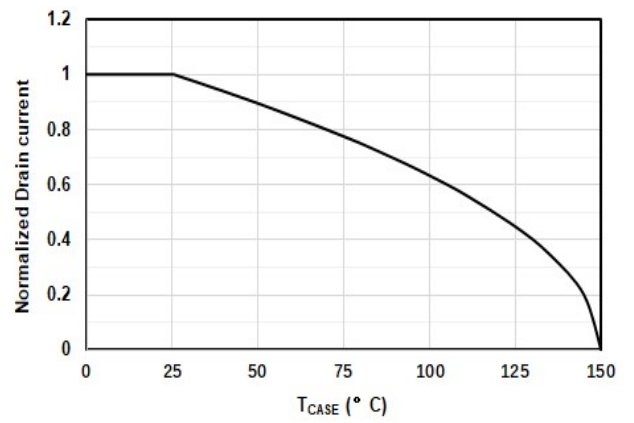
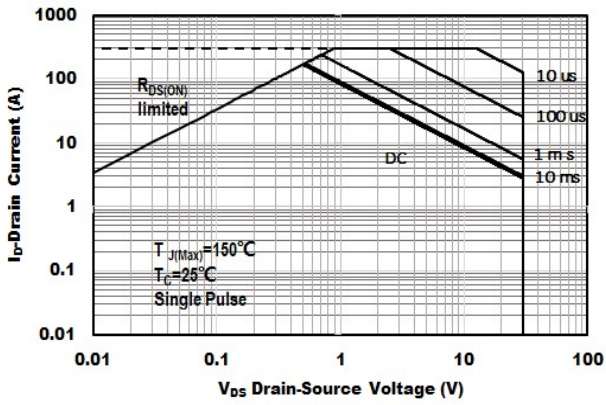
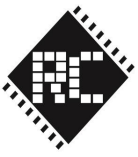
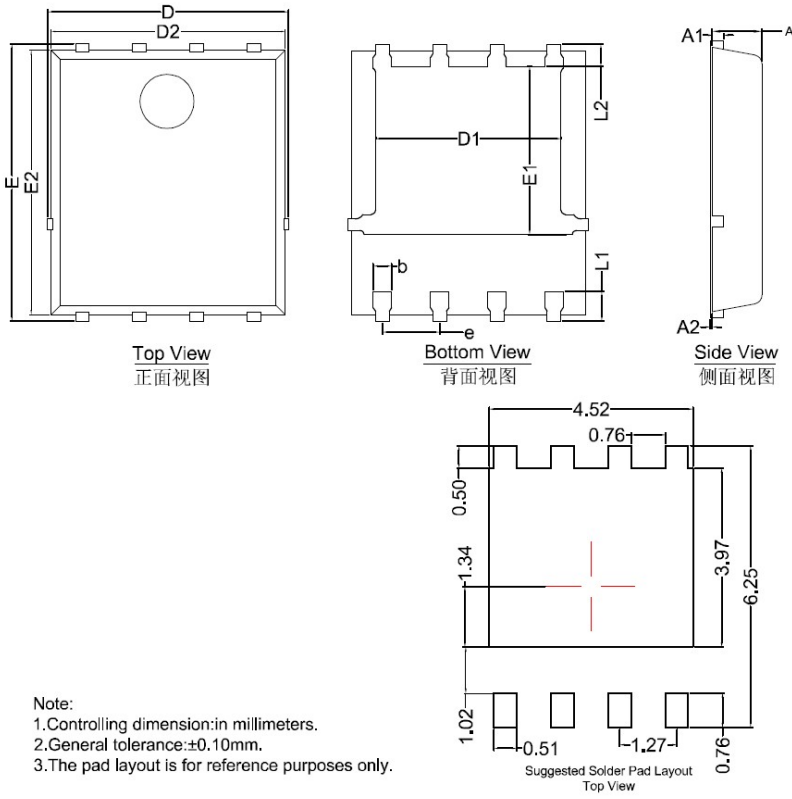


Figure9. Normalized Maximum Transient Thermal Impedance



■ PDFN5X6 Package Information



Note:
1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.10\text{mm}$.
3. The pad layout is for reference purposes only.

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
D	5.15	5.35	5.55
E	5.95	6.15	6.35
A	1.00	1.10	1.20
A1	0.254 BSC		
A2			0.10
D1	3.92	4.12	4.32
E1	3.52	3.72	3.92
D2	5.00	5.20	5.40
E2	5.66	5.86	6.06
L1	0.56	0.66	0.76
L2	0.50 BSC		
b	0.31	0.41	0.51
e	1.27 BSC		