

RM150N40DF

N-Channel Super Trench Power MOSFET

Description

The RM150N40DF uses **Super Trench** technology that is uniquely optimized to provide the most efficient high frequency switching performance. Both conduction and switching power losses are minimized due to an extremely low combination of $R_{DS(ON)}$ and Q_g . This device is ideal for high-frequency switching and synchronous rectification.

General Features

V_{DS} =40V,I_D =150A
 R_{DS(ON)}=1.72m (typical) @ V_{GS}=10V
 R_{DS(ON)}=2.3m (typical) @ V_{GS}=4.5V

- Excellent gate charge x R_{DS(on)} product(FOM)
- Very low on-resistance R_{DS(on)}
- 150 °C operating temperature
- Pb-free lead plating
- 100% UIS tested

Application

- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification
- Halogen-free

Package Marking and Ordering Information

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Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
FN40	RM150N40DF	DFN5X6-8L	-	-	-

Absolute Maximum Ratings (T_c=25[°]C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	Vds	40	V
Gate-Source Voltage	Vgs	±20	V
Drain Current-Continuous (Silicon Limited)	Ι _D	150	А
Drain Current-Continuous(T _C =100℃)	I _D (100℃)	106	A
Pulsed Drain Current (Package Limited)	I _{DM}	400	A
Maximum Power Dissipation	PD	88	W
Derating factor		0.7	W/℃
Single pulse avalanche energy (Note 5)	E _{AS}	720	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	°C







Top View

Bottom View

100% UIS TESTED! 100% ΔVds TESTED!

Thermal Characteristic

Thermal Resistance, Junction-to-CaseRejjc1.42°C/W

Electrical Characteristics (T_C=25[°]C unless otherwise noted)

Parameter	Symbol	Condition	Min	Тур	Max	Unit
Off Characteristics			•	1		<u></u>
Drain-Source Breakdown Voltage	BV _{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
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	$V_{DS}=V_{GS}$, $I_{D}=250\mu A$	1.2	1.5	2.2	V
Drain Source On State Registence	Proven	V_{GS} =10V, I _D =75A	-	1.72	2.1	m
Drain-Source On-State Resistance	RDS(ON)	V_{GS} =4.5V, I _D =75A	-	2.3	2.8	m
Forward Transconductance	g fs	V_{DS} =5V, I_{D} =75A	-	80	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C _{lss}		-	6000	7150	PF
Output Capacitance	Coss	$v_{\rm DS}$ -20V, $v_{\rm GS}$ -0V,	$\begin{array}{c c c c c c c c c c c c c c c c c c c $			
Reverse Transfer Capacitance	C _{rss}		-	100	145	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	t _{d(on)}		-	12.5	-	nS
Turn-on Rise Time	tr	V_{DD} =20V, I_{D} =75A	-	7.0	-	nS
Turn-Off Delay Time	t _{d(off)}	V_{GS} =10V, R_{G} =1.6 Ω	-	50	-	nS
Turn-Off Fall Time	t _f		-	8.5	-	nS
Total Gate Charge	Qg	\/	-	95	115	nC
Gate-Source Charge	Q _{gs}	$v_{DS} = 20v, I_D = 73A,$	-	15		nC
Gate-Drain Charge	Q _{gd}	$- V_{GS} = 10V - 15$ $- 15$ $- 11$			nC	
Drain-Source Diode Characteristics			•	•		
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V,I _S =75A	-		1.2	V
Diode Forward Current (Note 2)	I _S		-	-	150	A
Reverse Recovery Time	t _{rr}	$T_J = 25^{\circ}C, I_F = I_S$	-		31	nS
Reverse Recovery Charge	Qrr	di/dt = 100A/µs ^(Note3)	-		110	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Surface Mounted on FR4 Board, t ≤ 10 sec.

3. Pulse Test: Pulse Width ≤ 300µs, Duty Cycle ≤ 2%.

4. Guaranteed by design, not subject to production

5. EAS condition : Tj=25 $^\circ \!\! \mathbb{C}$,V_{DD}=20V,V_G=10V,L=0.5mH,Rg=25 $\!\Omega$



RATING AND CHARACTERISTICS CURVES (RM150N40DF)



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DFN5X6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches		
	Min.	Max.	Min.	Max.	
A	0.900	1.000	0.035	0.039	
A3	0.254REF.		0.010REF.		
D	4.944	5.096	0.195	0.201	
E	5.974	6.126	0.235	0.241	
D1	3.910	4.110	0.154	0.162	
E1	3.375	3.575	0.133	0.141	
D2	4.824	4.976	0.190	0.196	
E2	5.674	5.826	0.223	0.229	
k	1.190	1.390	0.047	0.055	
b	0.350	0.450	0.014	0.018	
е	1.270TYP.		0.050TYP.		
L	0.559	0.711	0.022	0.028	
L1	0.424	0.576	0.017	0.023	
Н	0.574	0.726	0.023	0.029	
θ	8°	12°	8°	12°	



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