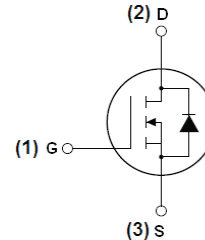


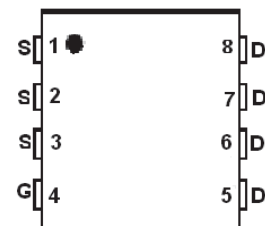
N-Channel Enhancement Mode Power MOSFET

Description

The RM42N200DF uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge. It can be used in a wide variety of applications.



Schematic diagram



Marking and pin assignment



DFN5X6-8L top view

General Features

- $V_{DS} = 200V, I_D = 42A$
 $R_{DS(on)} < 32m\Omega @ V_{GS} = 10V$
- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$
- Pb-free lead plating
- 100% UIS tested

Application

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

100% UIS TESTED!

100% ΔV_{ds} TESTED!

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
42N200	RM42N200DF	DFN5X6-8L	-	-	-

Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous (Package Limited) ($T_C = 25^\circ C$)	I_D	42	A
Drain Current-Continuous (Package Limited) ($T_C = 100^\circ C$)		26	A
Pulsed Drain Current	I_{DM}	140	A
Maximum Power Dissipation	P_D	150	W
Single pulse avalanche energy (L=0.4mH)	E_{AS}	180	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ C$

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient ^(Note 2)	$R_{\theta JA}$	50	$^{\circ}\text{C}/\text{W}$
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Electrical Characteristics ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250A$	200	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=200V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics ^(Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	2.0	3.0	4.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=10A$	-	28	32	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=10A$	-	31	-	S
Dynamic Characteristics ^(Note 4)						
Input Capacitance	C_{iss}	$V_{DS}=100V, V_{GS}=0V,$ $F=1.0\text{MHz}$	-	1598	-	PF
Output Capacitance	C_{oss}		-	124	-	PF
Reverse Transfer Capacitance	C_{rss}		-	7.5	-	PF
Switching Characteristics ^(Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=100V, I_D=10A$ $V_{GS}=10V, R_G=10\Omega$	-	12	-	nS
Turn-on Rise Time	t_r		-	17	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	23	-	nS
Turn-Off Fall Time	t_f		-	10	-	nS
Total Gate Charge	Q_g	$V_{DD}=100V, I_D=10A$ $V_{GS}=10V$	-	19	-	nC
Gate-Source Charge	Q_{gs}		-	7	-	nC
Gate-Drain Charge	Q_{gd}		-	2	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 3)	V_{DS}	$V_{GS}=0V, I_F=10A$	-	0.9	1.2	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

RATING AND CHARACTERISTICS CURVES (RM42N200DF)

Fig 1. Typical Output Characteristics

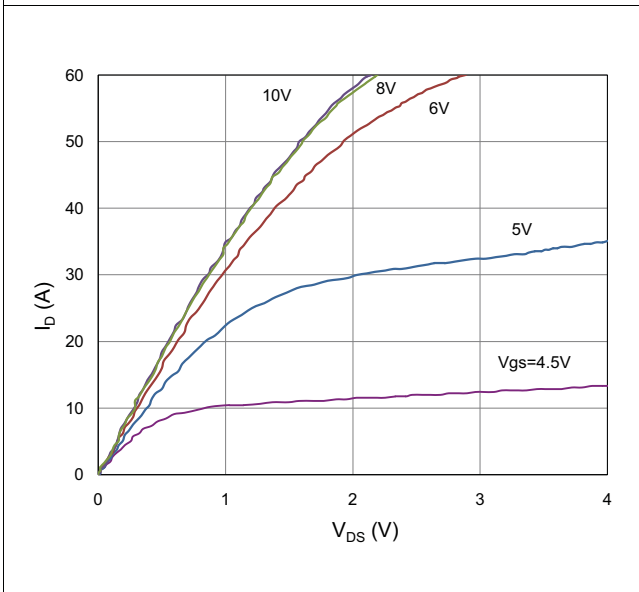


Figure 2. On-Resistance vs. Gate-Source Voltage

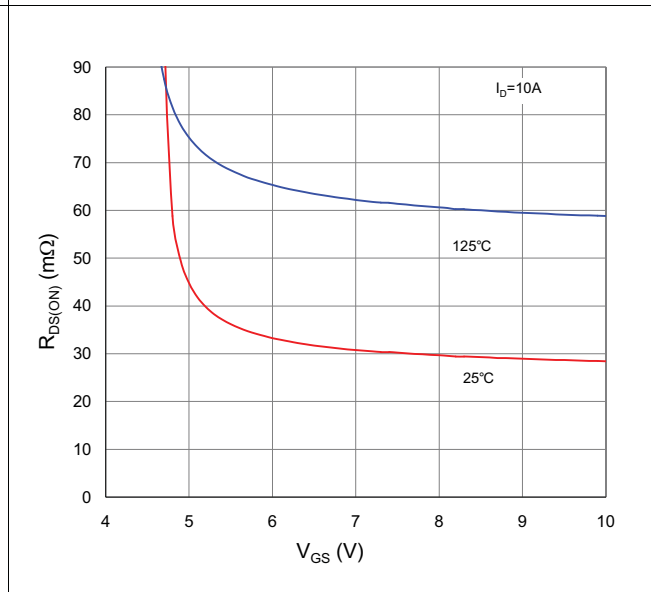


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

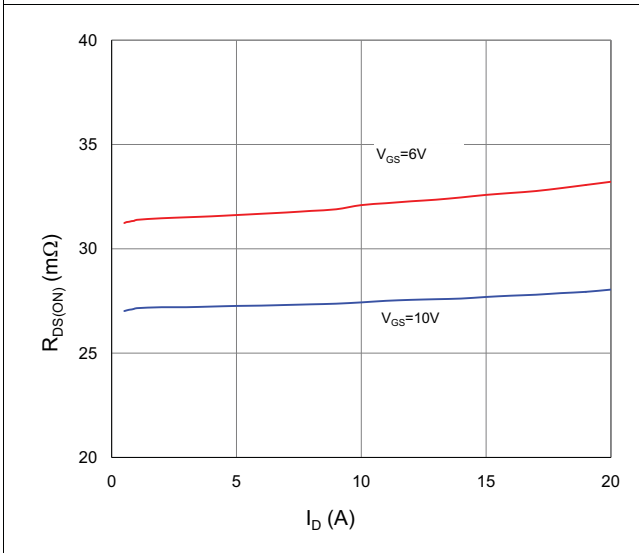


Figure 4. Normalized On-Resistance vs. Junction Temperature

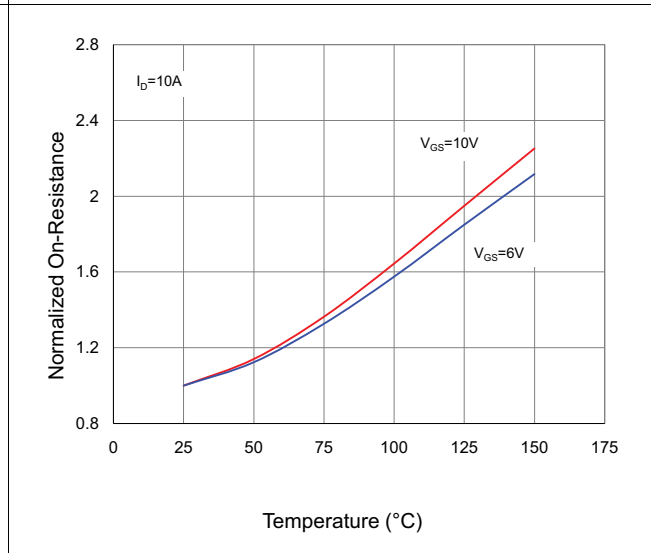


Figure 5. Typical Transfer Characteristics

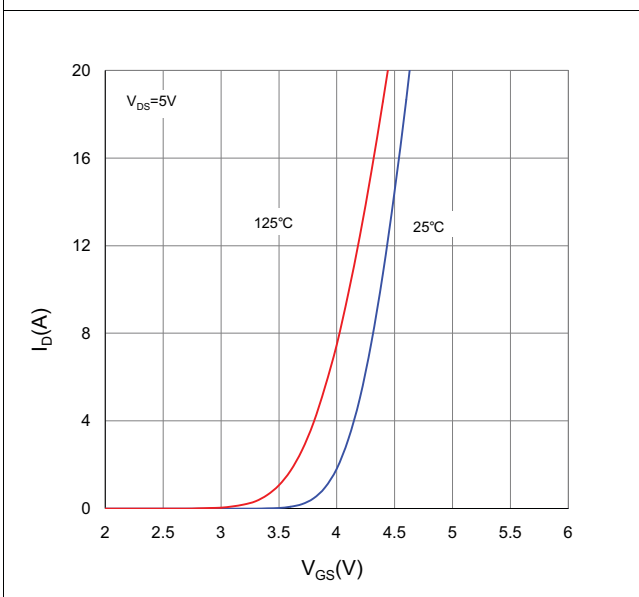
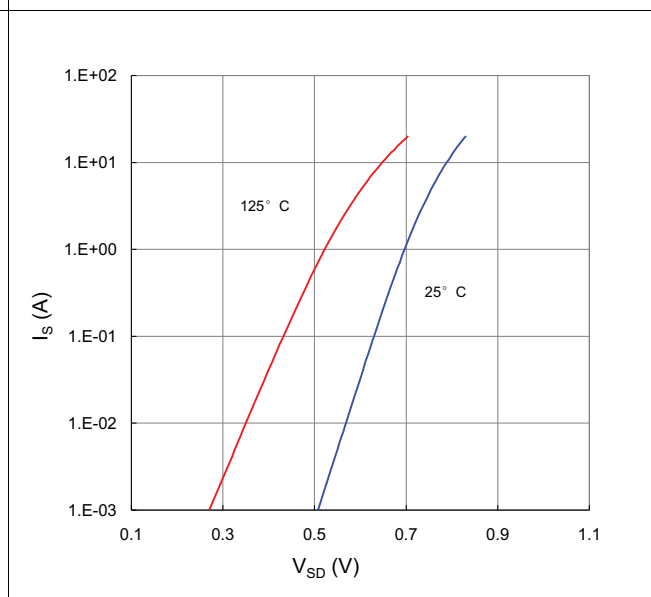


Figure 6. Typical Source-Drain Diode Forward Voltage



RATING AND CHARACTERISTICS CURVES (RM42N200DF)

Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

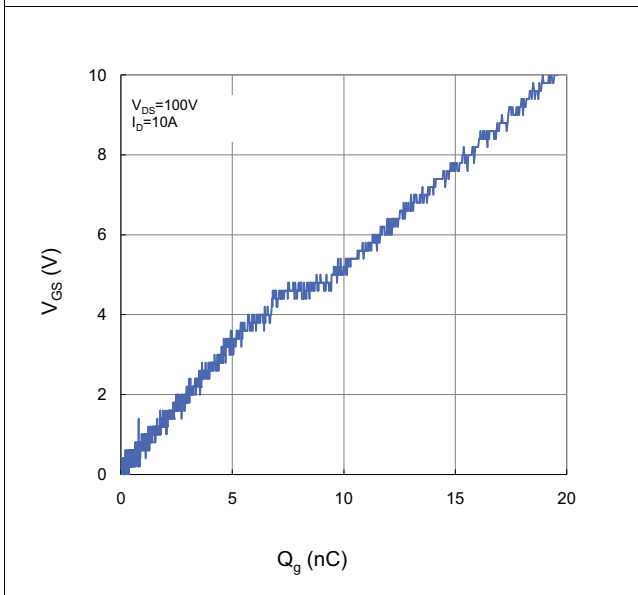


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

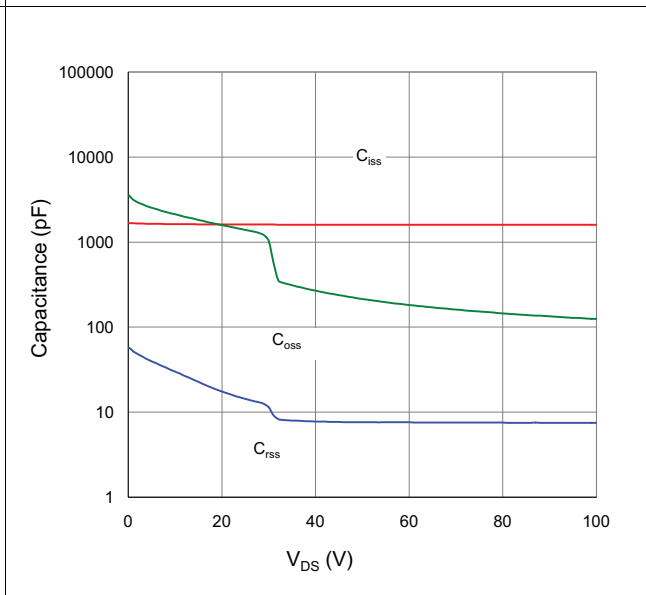


Figure 9. Maximum Safe Operating Area

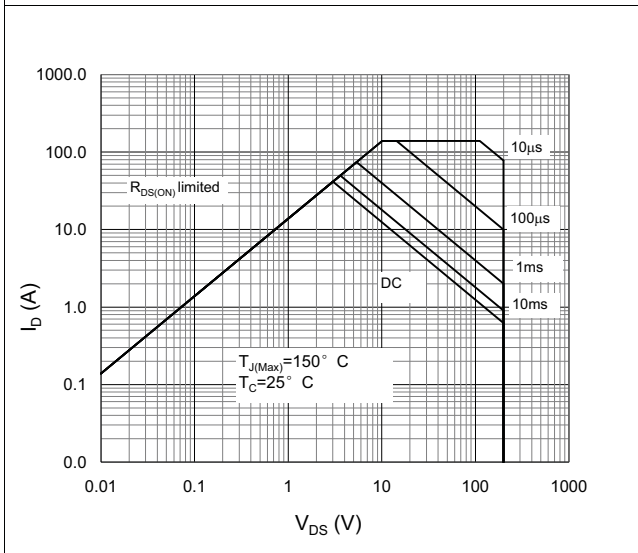


Figure 10. Maximum Drain Current vs. Case Temperature

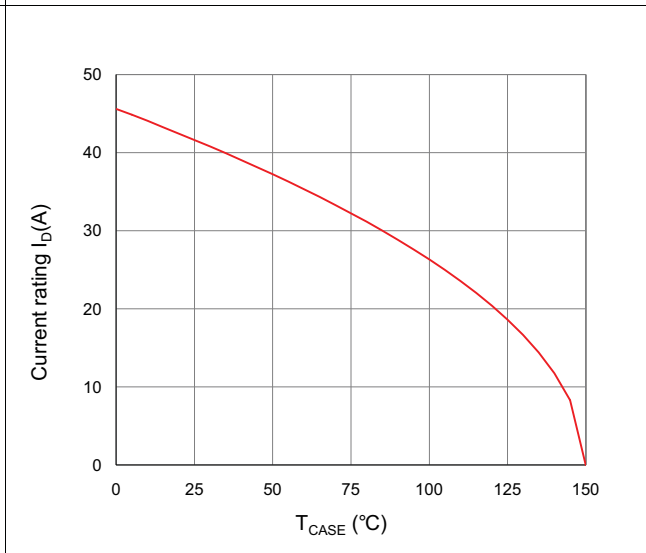
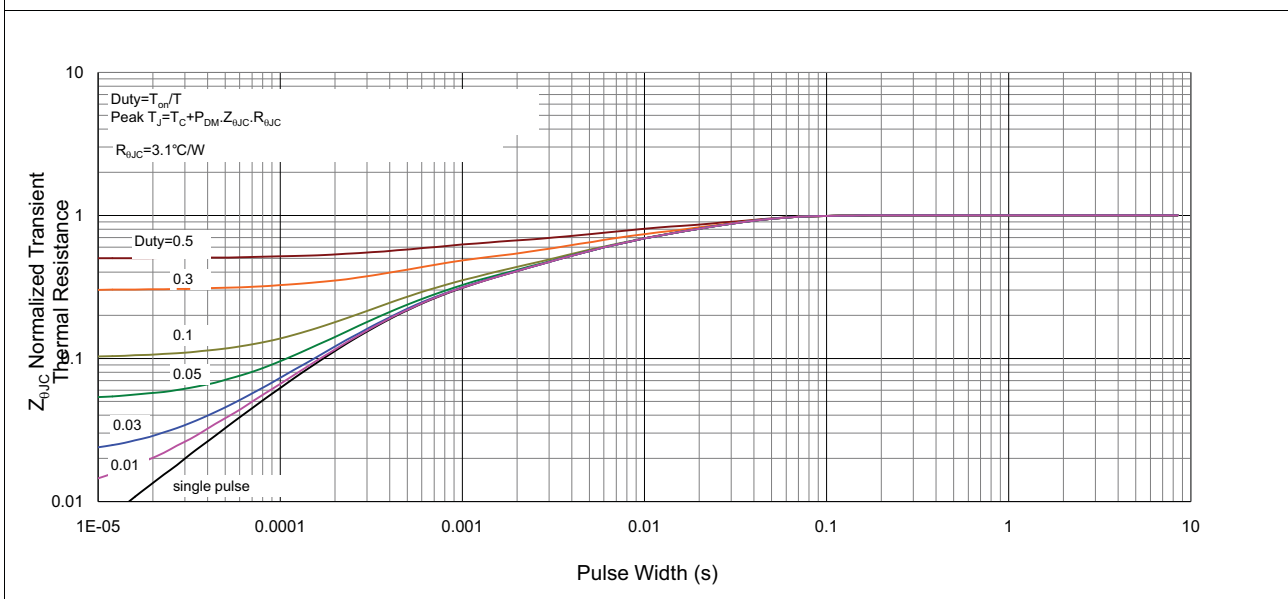
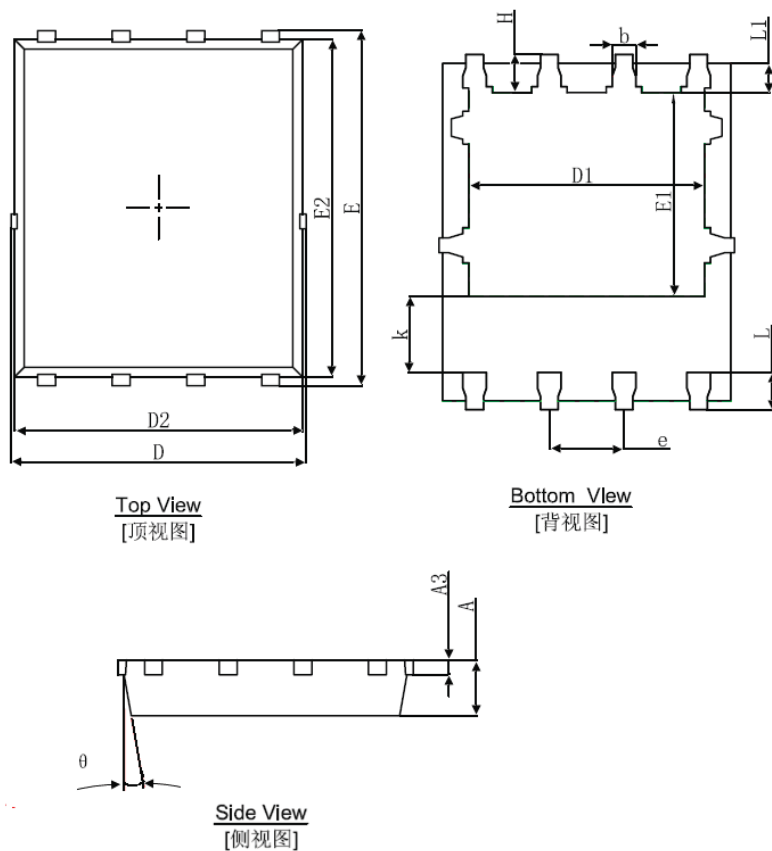


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case



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
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	8°	12°	8°	12°

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