MTR7R4N04D33

10-JUN-2022

N-Channel Enhancement Mode Power MOSFET

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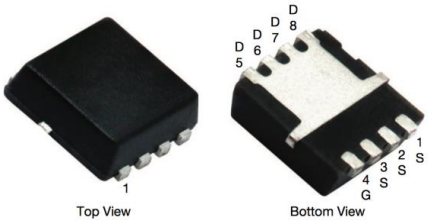
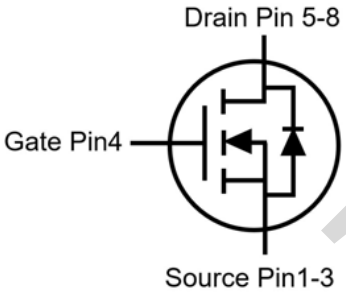
PDFN3x3-8L





V_{DS}	40	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	7.4	mΩ
I_D	47	A

Features

1、Low on – resistance

2、High power package (PDFN3x3-8L)

3、Proprietary Trench Gate Device Design and Processes

4、Halogen free

Applications

1、DC/DC Converters in Computing, Servers, and POL

2、Isolated DC/DC Converters in Telecom and Industrial

Maximum ratings, at T_A =25°C, unless otherwise specified

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		40	V
V_{GS}	Gate-Source voltage		±20	V
I_D	Continuous drain current @VGS=10V	T_C =25°C	47	A
		T_C =70°C	37.4	A
I_{DM}	Pulse drain current tested ①	T_C =25°C	196	A
E_{AS}	Avalanche energy, single pulsed ②		35	mJ
P_D	Maximum power dissipation	T_C =25°C	29.8	W
T_{STG},T_J	Storage and Junction Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	33	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	4.2	°C/W

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @Tj=25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	40	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=40V,V_{GS}=0V	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.0	--	2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance ④	V_{GS}=10V, I_D=1A V_{GS}=4.5V, I_D=1A	--	4.7 7.4	7.4 9.6	mΩ

Dynamic Electrical Characteristics@Tj = 25°C (unless otherwise stated)

C_{iss}	Input Capacitance	V_{DS}=20V,V_{GS}=0V , f=1.0MHz	--	947	--	pF
C_{oss}	Output Capacitance		--	157	--	pF
C_{rss}	Reverse Transfer Capacitance		--	10	--	pF
R_g	Gate Resistance	V_{DS}=0V,V_{GS}=0V f =1MHz	--	1.7	--	Ω
Q_g	Total Gate Charge	V_{DS}=20V, I_D=20A , V_{GS}=4.5V	--	16.1	--	nC
Q_{gs}	Gate-Source Charge		--	45	--	nC
Q_{gd}	Gate-Drain Charge		--	5.6	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	Tj=25°C, V_{DD}=20V, V_{DS}=10V, R_G=1Ω I_D=10A	--	19	--	ns
Tr	Turn-on Rise Time		--	84	--	ns
Td(off)	Turn-Off Delay Time		--	28	--	ns
Tf	Turn-Off Fall Time		--	11	--	ns

Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)

V_{SD}	Forward on voltage	I_{SD}=1A,V_{GS}=0V	--	--	1.2	V
Is	Continuous Source Current1.5	VG=VD=0V Force Current	--	60.2	--	ns

NOTE: ① Repetitive rating; pulse width limited by max junction temperature.

② Limited by T_{Jmax}, s tarting T_J = 2 5°C, L=0.5mH,Rg=25Ω. Part not recommended for use above this value

③ The power dissipation P_{DSM} i s based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150°C.

④ Pulse Width tp = < 1 mS, Duty Cycle < 2%.

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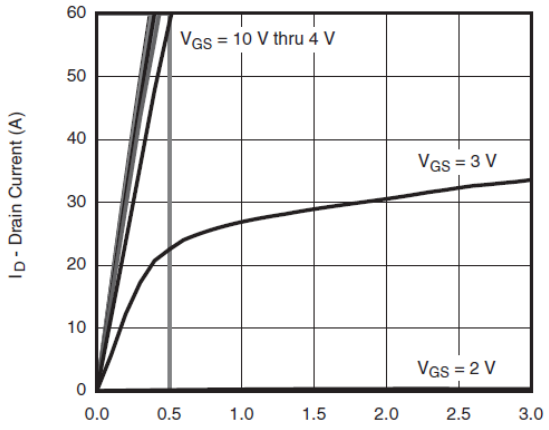
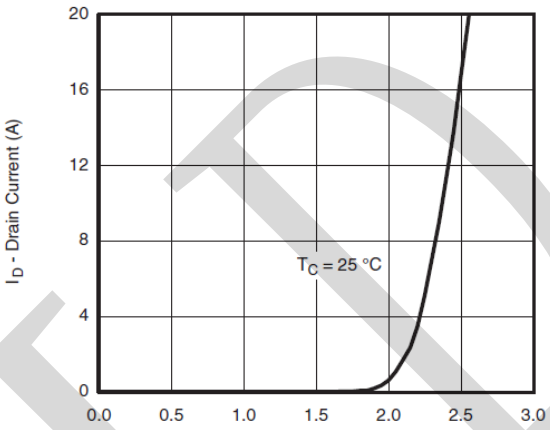
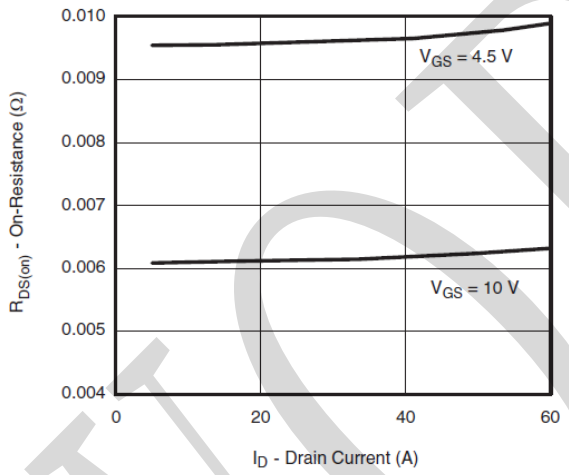
Typical Characteristics



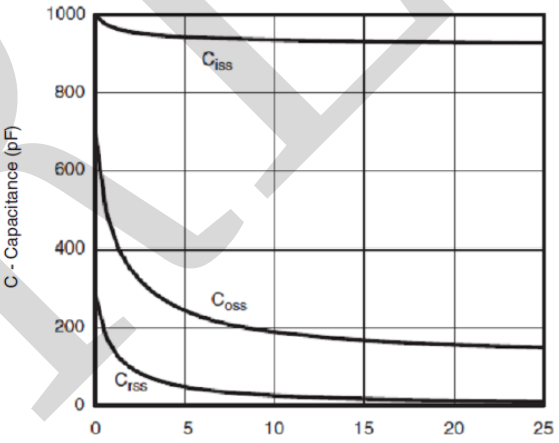
Output Characteristics



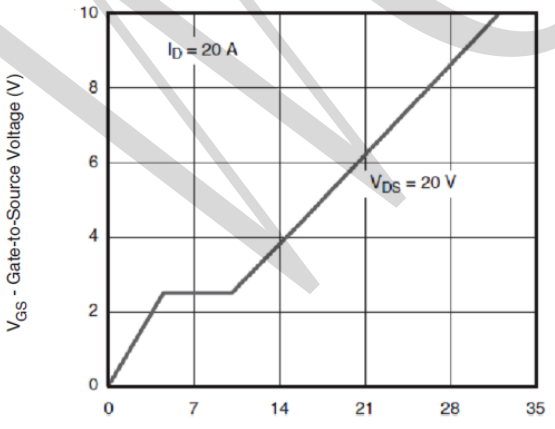
Transfer Characteristics



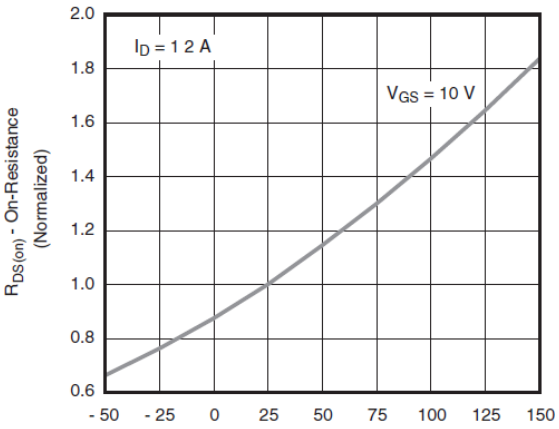
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



Gate Charge



On-Resistance vs. Junction Temperature

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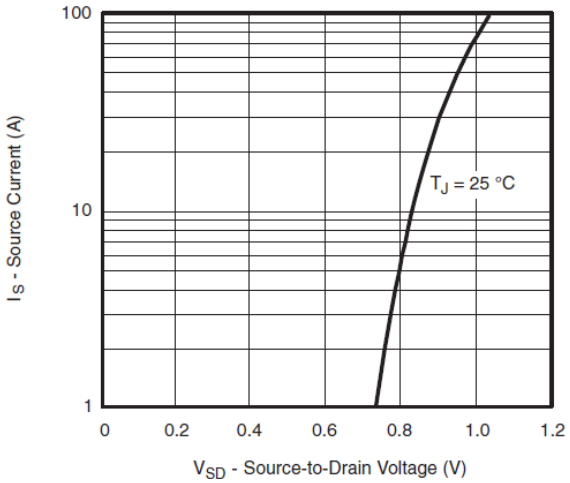
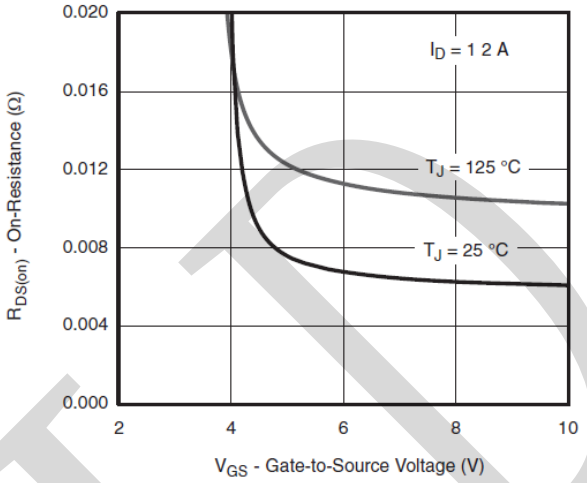
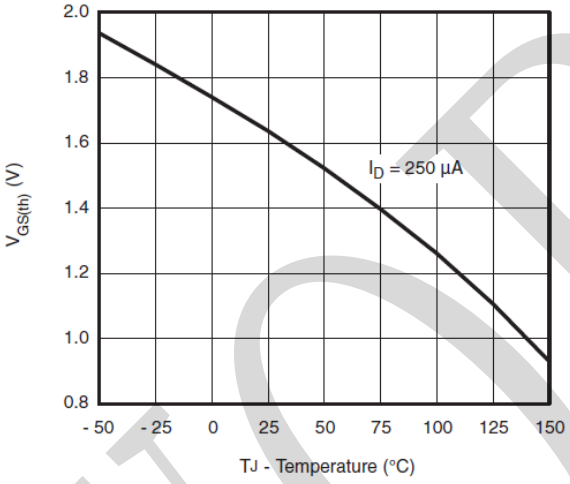
Typical Characteristics



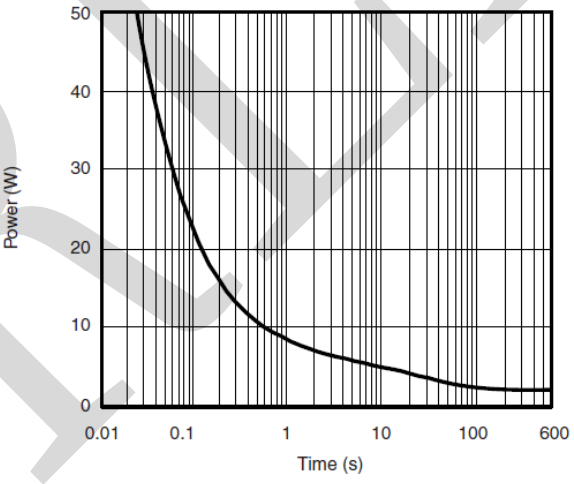
Source-Drain Diode Forward Voltage



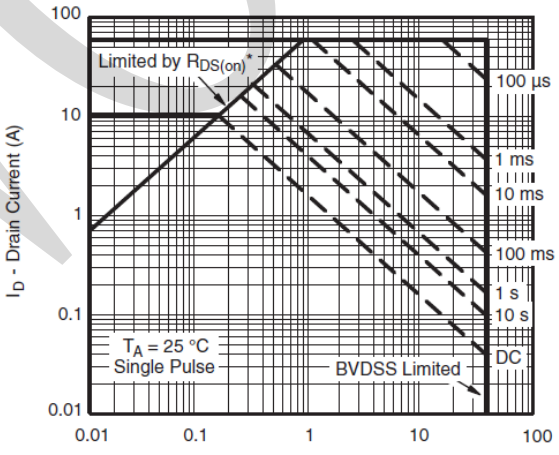
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



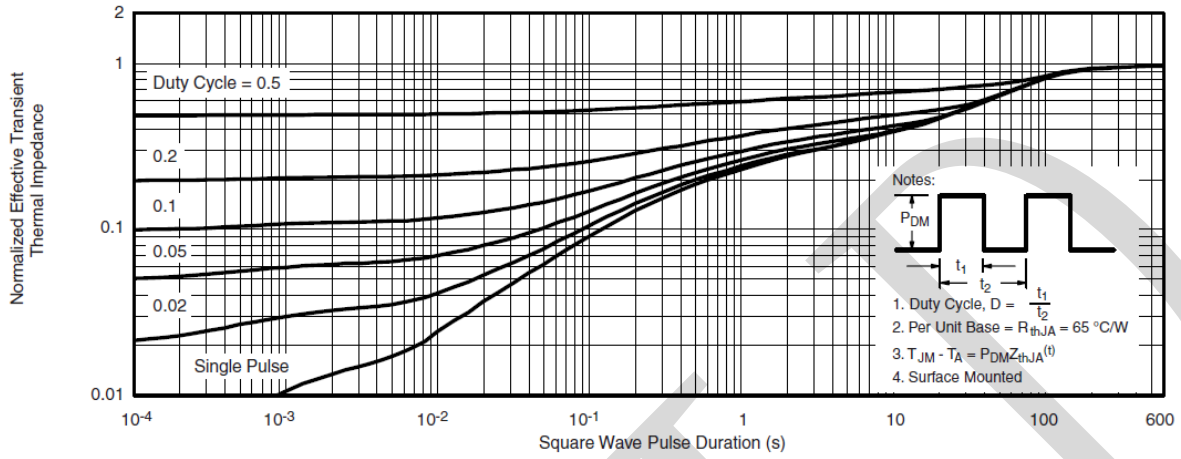
Single Pulse Power (Junction-to-Ambient)



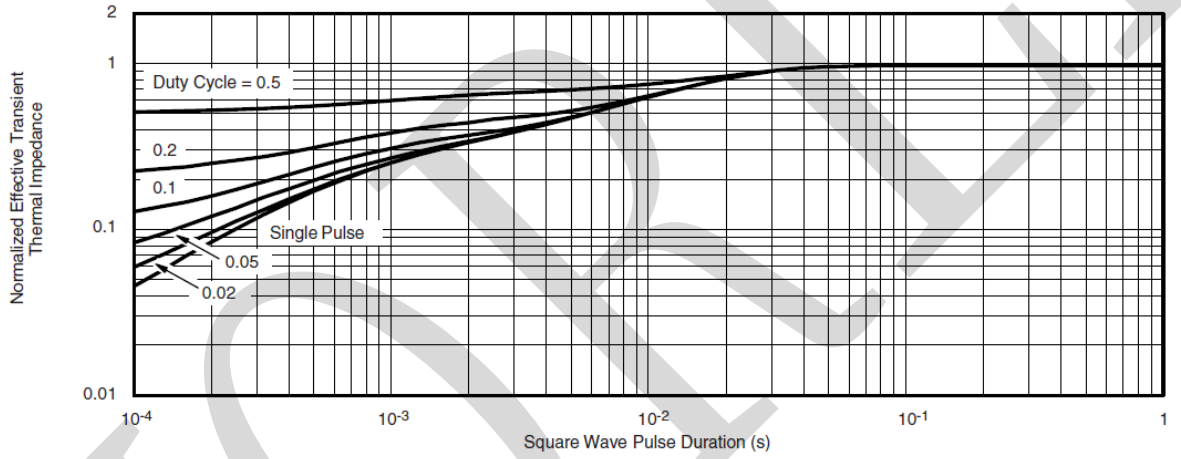
* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

Typical Characteristics



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

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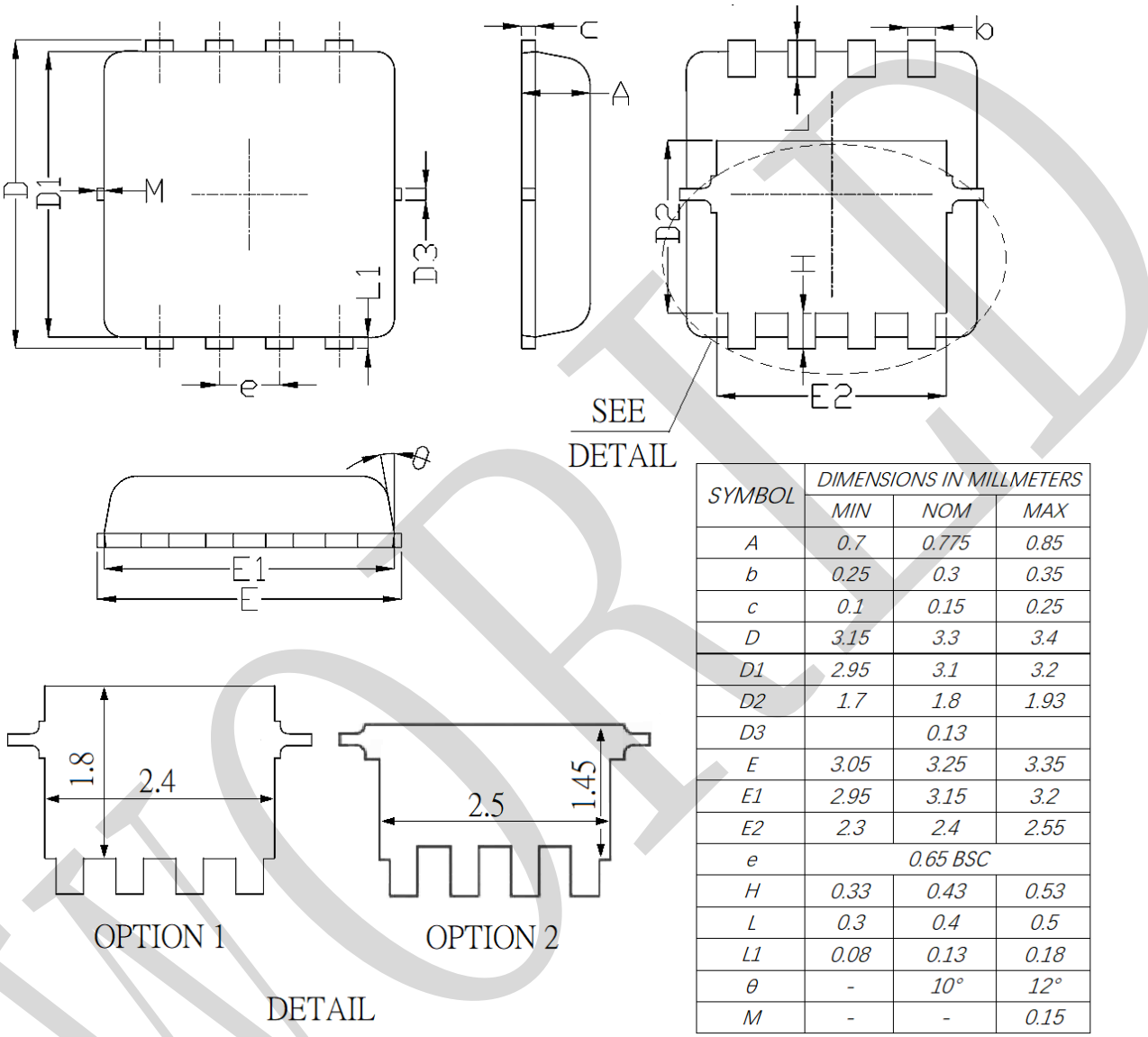
PACKAGE OUTLINE DIMENSIONS



SYMBOL	DIMENSIONS IN MILLMETERS		
	MIN	NOM	MAX
A	0.7	0.775	0.85
b	0.25	0.3	0.35
c	0.1	0.15	0.25
D	3.15	3.3	3.4
D1	2.95	3.1	3.2
D2	1.7	1.8	1.93
D3		0.13	
E	3.05	3.25	3.35
E1	2.95	3.15	3.2
E2	2.3	2.4	2.55
e		0.65 BSC	
H	0.33	0.43	0.53
L	0.3	0.4	0.5
L1	0.08	0.13	0.18
θ	-	10°	12°
M	-	-	0.15

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