

Description

The DMT2004UFDF-7 is the new generation trench N-channel MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) yet maintain superior switching performance, making it ideal for high efficiency power management applications

Features

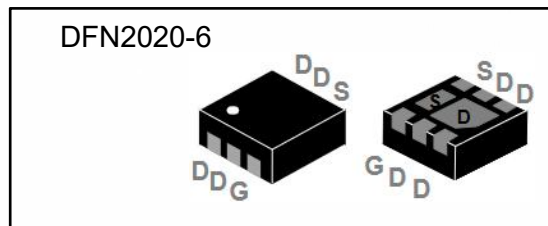
- For extremely low $R_{DS(ON)}$
- Improved dv/dt capability
- Fast switching
- Green Device Available

Applications

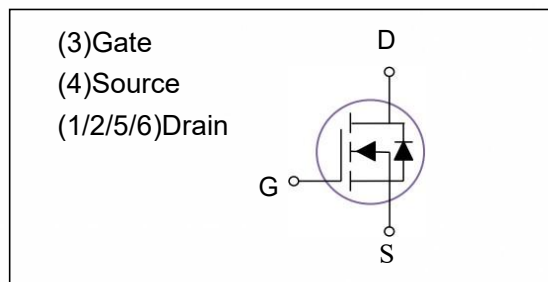
- Battery Management Application
- Load Switch
- Power Management Functions
- DC-DC Converters

V_{DSS}	30V
I_D	15A
$R_{DS(ON)}$	$22m\Omega @ V_{GS}=4.5V$
$R_{DS(ON)}$	$26m\Omega @ V_{GS}=2.5V$

Outline



Equivalent



Packaging specifications

Part No.	Package	Marking	Basic ordering unit.(pcs)
DMT2004UFDF-7	DFN2020-6		3000

Absolute Maximum Ratings

Parameter		Symbol	Limit	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 12	V
Drain Current-Continuous(Note2)	$T_A=25^\circ C$	I_D	15	A
	$T_A=70^\circ C$		12	A
-Pulsed(Note 1· Note 2)		I_{DM}	40	A
Maximum Power Dissipation	$T_A=25^\circ C$	P_D	2.1	W
	$T_A=70^\circ C$		1.3	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ C$
Thermal Resistance Junction-Ambient		$R_{\theta JA}$	63	$^\circ C / W$
Thermal Resistance Junction-Case		$R_{\theta JC}$	18	$^\circ C / W$

Electrical Characteristics (TC=25 °C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V , I _D =250uA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V , V _{GS} =0V			1	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±12V , V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250uA	0.5	0.9	1.3	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =4.5V , I _D =4A		22	28	mΩ
		V _{GS} =2.5V , I _D =3A		26	40	mΩ
DYNAMIC CHARACTERISTICS Note4						
Input Capacitance	C _{ISS}	V _{DS} =10V , V _{GS} =0 V , f =1.0MHz		660		pF
Output Capacitance	C _{OSS}			50		pF
Reverse Transfer Capacitance	C _{RSS}			40		pF
Total Gate Charge	Q _g	V _{DS} =10V , I _D =4A , V _{GS} =4.5V		8.2		nC
Gate-Source Charge	Q _{gs}	V _{DS} =10V , I _D =4A , V _{GS} =4.5V		1.5		nC
Gate-Drain Charge	Q _{gd}			2.5		nC
SWITCHING CHARACTERISTICS Note4						
Turn-On Delay Time	t _{D(ON)}	V _{DD} =10V , I _D =1A , V _{GS} =4.5V , R _G =6Ω		4.8		ns
Rise Time	tr			15		ns
Turn-Off Delay Time	t _{D(OFF)}			27		ns
Fall Time	tf			8.6		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Diode Forward Voltage	V _{SD}	V _{GS} =0V , I _S =3A			1	V

Notes:

- 1、Pulse Test Width < 300us,Duty Cycle< 2%
- 2、Drain current limited by maximum junction temperature.
- 3、Guaranteed by design,not subject to production testing.

Typical Performance Characteristics

Fig.1 Continuous Drain Current vs. TC

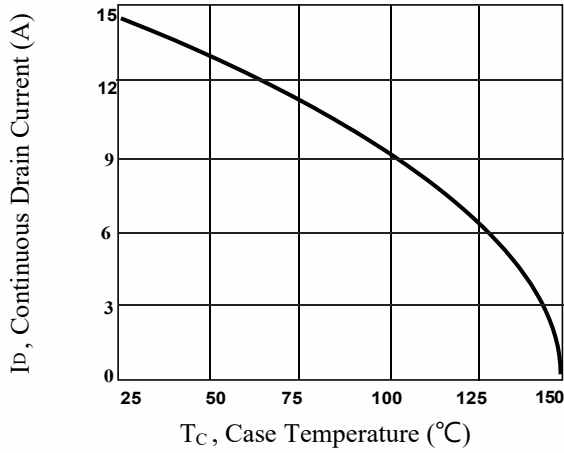


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

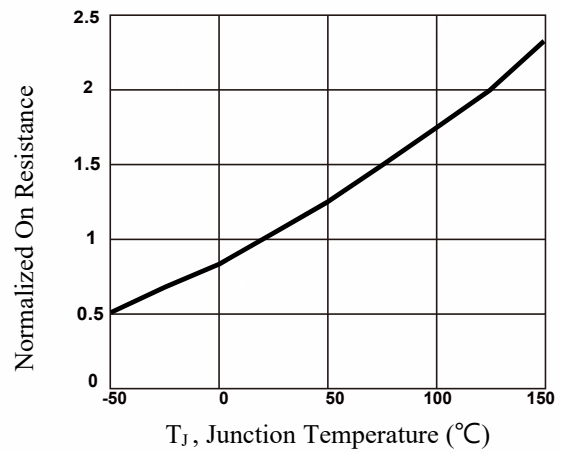


Fig.3 Normalized V_{th} vs. T_J

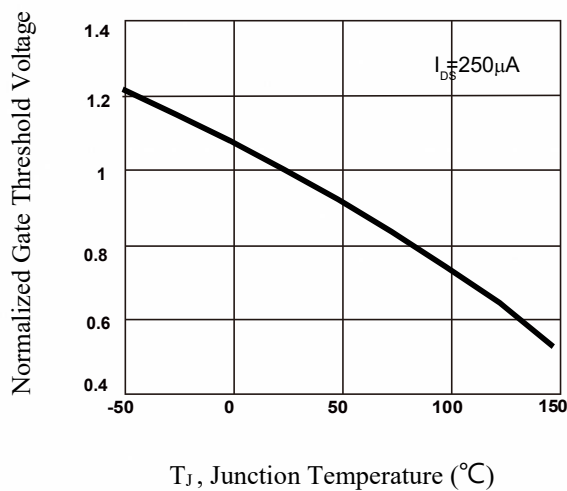


Fig.4 Gate Charge Waveform

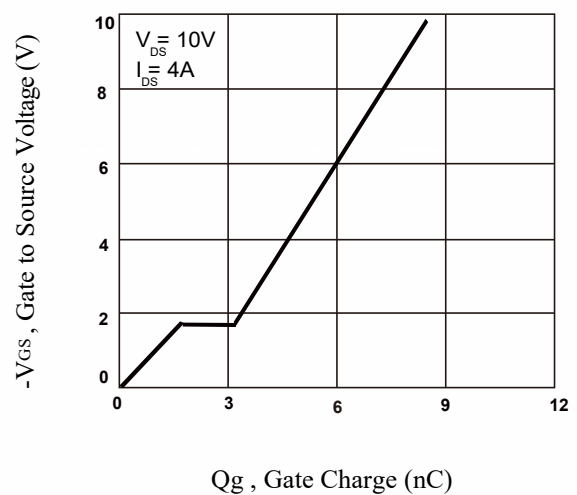


Fig.5 Typical Output Characteristics

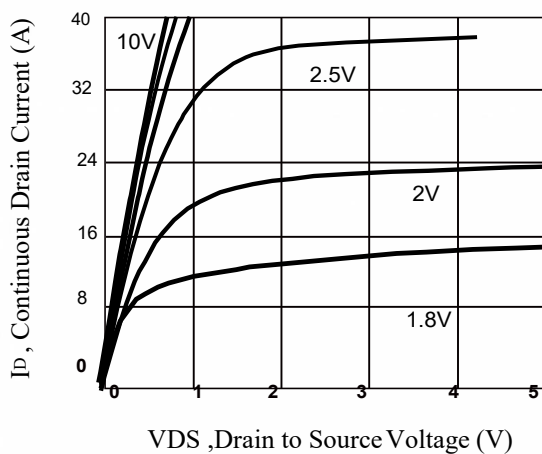


Fig.6 Capacitance

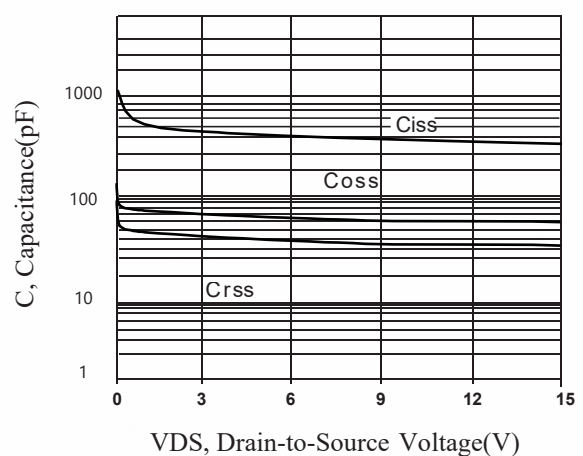


Fig.7 Turn-On Resistance vs. ID

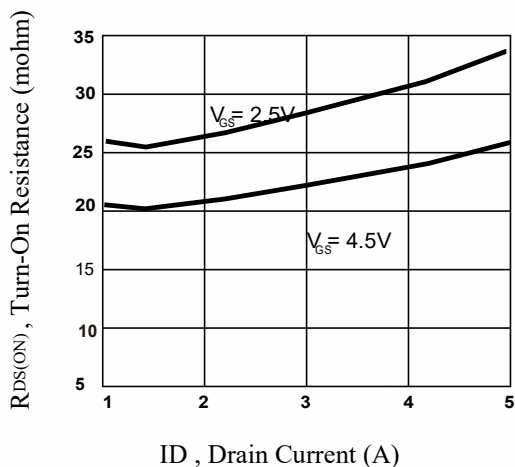


Fig.8 Typical Source-Drain Diode Forward Voltage

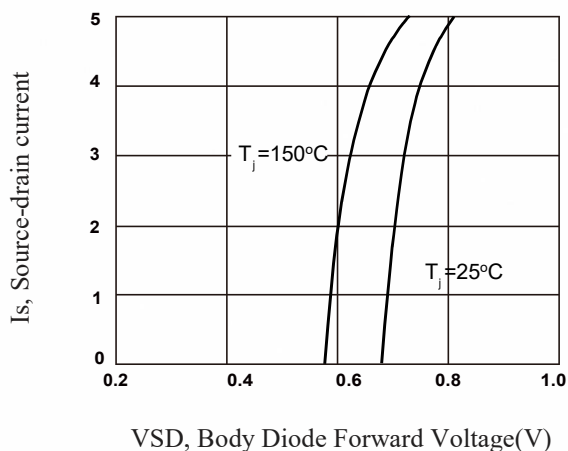


Fig.9 Normalized Transient Impedance

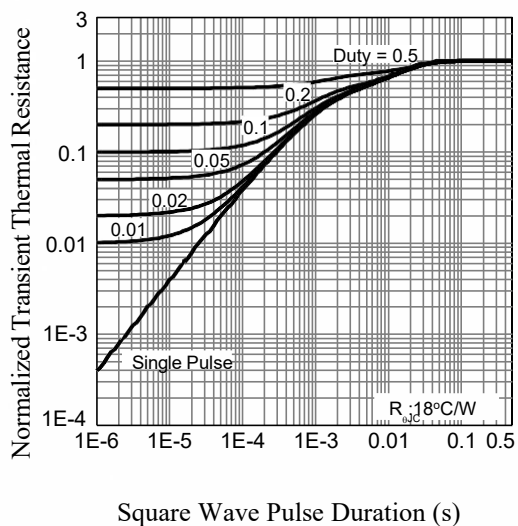


Fig.10 Maximum Safe Operation Area

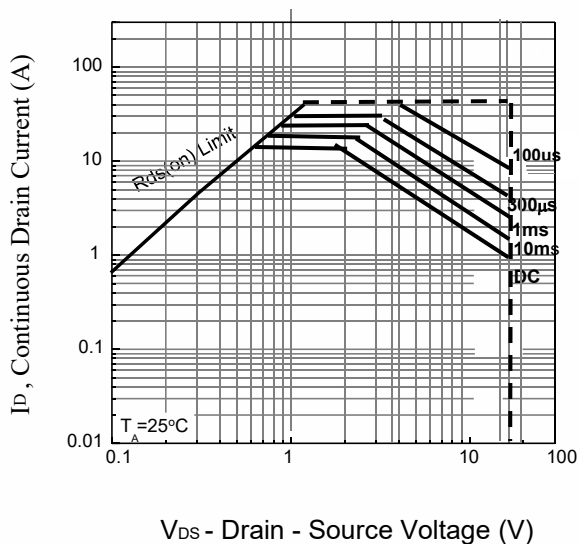


Figure11a. Switching Test Circuit

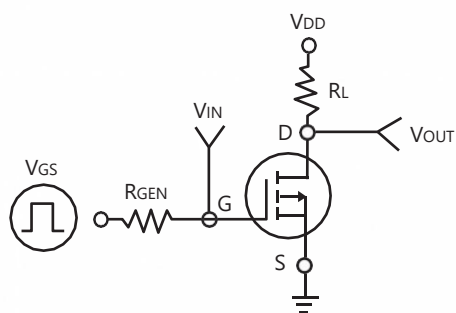
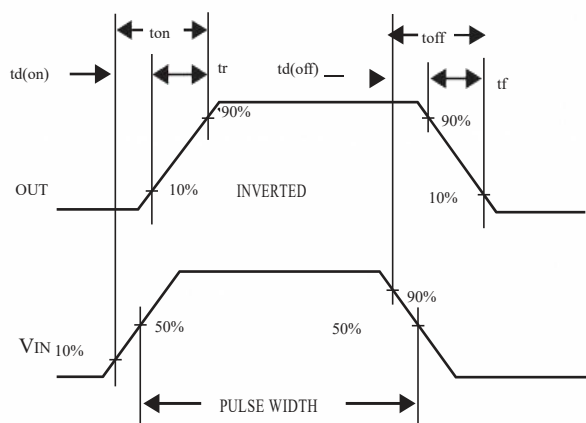
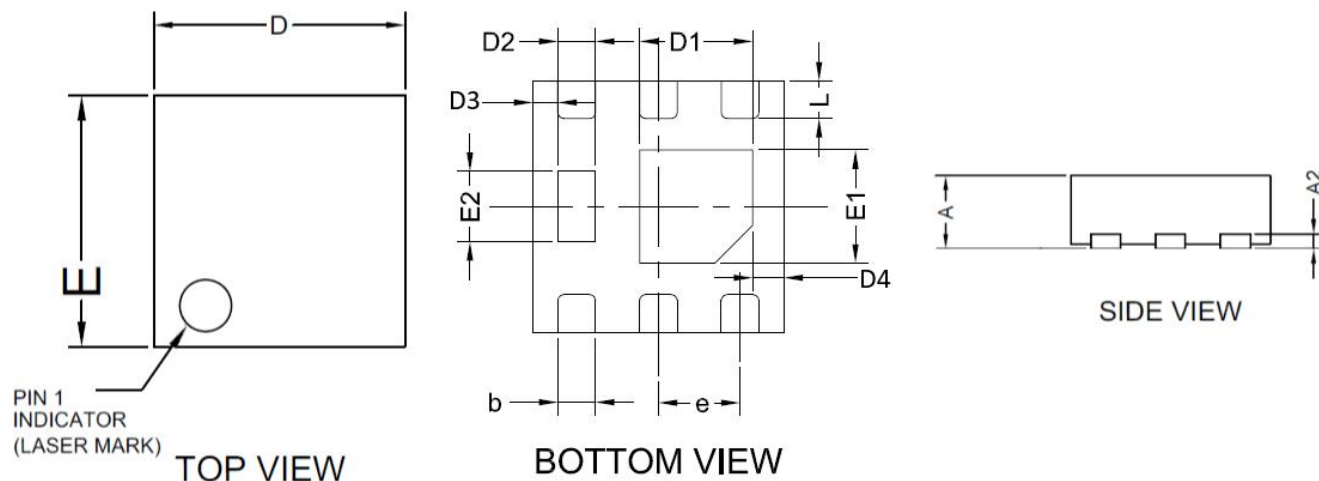


Figure 11b. Switching Waveforms



DFN2020-6 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	0.800	0.500	0.031	0.019
A2	0.250	0.145	0.010	0.006
b	0.350	0.250	0.014	0.010
D	2.100	1.900	0.083	0.075
D1	1.050	0.800	0.041	0.031
D2	0.430	0.250	0.017	0.010
D3	0.200BSC		0.008BSC	
D4	0.200BSC		0.008BSC	
E	2.100	1.900	0.083	0.075
E1	1.250	0.800	0.049	0.031
E2	0.750	0.460	0.029	0.018
e	0.650BSC		0.026BSC	
L	0.350	0.225	0.014	0.009

NOTICE

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