



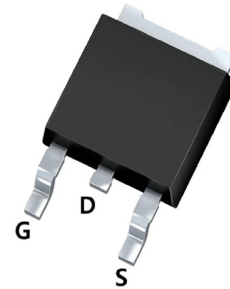
1. Features

- V_{DS} -40V
- I_D (at $V_{GS}=-10V$) -45A
- $R_{DS(ON)}$ (at $V_{GS}=-10V$) 12m Ω (Typ)

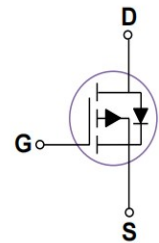
2. Mechanical Data

- Case:Molded Plastic,TO-252 .
- Epoxy:UL 94V-0 rate flame retardant
- Terminals:Plated Leads Solderable perMIL-STD-750,Method-2026.
- Marking:DMD40P04
- Mounting Position : Any.

TO-252



- 1 Gate
- 2 Source
- 3 Drain



3. Maximum Ratings and Electrical Characteristics

Rating at 25°C ambient temperature unless otherwise specified.

Parameter		Symbol	Value	UNIT
Drain-Source Voltage		V_{DS}	-40	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^\circ\text{C}$	I_D	-45	A
	$T_C = 100^\circ\text{C}$		-28	
Drain Current-Pulsed		I_{DM}	-180	A
Power Dissipation		P_{tot}	74	W
Single pulse avalanche energy ⁽¹⁾		E_{AS}	160	mJ
Thermal Resistance from Junction to Lead		$R_{\theta JC}$	1.7	$^\circ\text{C/W}$
Thermal Resistance from Junction to Ambient		$R_{\theta JA}$	62	$^\circ\text{C/W}$
Junction and Storage Temperature Range		T_J, T_{STG}	-55~ +150	$^\circ\text{C}$

**4. Electrical Characteristics**

Rating at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-source breakdown voltage	V _{(BR) 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-source leakage current	I _{GSS}	V _{GS} =±20V,V _{DS} =0V			±100	nA
On characteristics						
Drain-source on-resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-10A		12	16	mΩ
		V _{GS} =-4.5V, I _D =-8A		17	22	mΩ
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1	-1.6	-2.5	V
Dynamic Characteristics						
Input capacitance	C _{iss}	V _{DS} =-25V,V _{GS} =0V,f =1MHz		2700		pF
Output capacitance	C _{oss}			240		pF
Reverse transfer capacitance	C _{rss}			130		pF
Switching Characteristics						
Gate charge total	Q _g	V _{DS} = -20 V, I _D = -5 A, V _{GS} = -4.5 V		22		nC
Gate-Source Charge	Q _{gs}			8.2		nC
Gate-Drain Charge	Q _{gd}			8.8		nC
Turn-on delay time	t _{d(on)}	V _{DD} = -20 V, V _{GS} = -10V, I _D =-1A, R _G = 6 Ω		23		nS
Turn-on rise time	t _r			10		nS
Turn-off delay time	t _{d(off)}			135		nS
Turn-off fall time	t _f			46		nS
Source-Drain Diode characteristics						
Body Diode Voltage	V _{SD}	I _{SD} =-1A,V _{GS} =0V		0.7	1.2	V

Notes :

- 1.Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD} = -25V, V_{GS} = -10V, L = 0.1mH, I_{AS} = -51A, R_G = 25\Omega$, Starting $T_J = 25^\circ C$
- 3.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 4.Essentially independent of operating temperature.



5. Rating And Characteristic Curves

Fig1: Continuous Drain Current vs. T_C

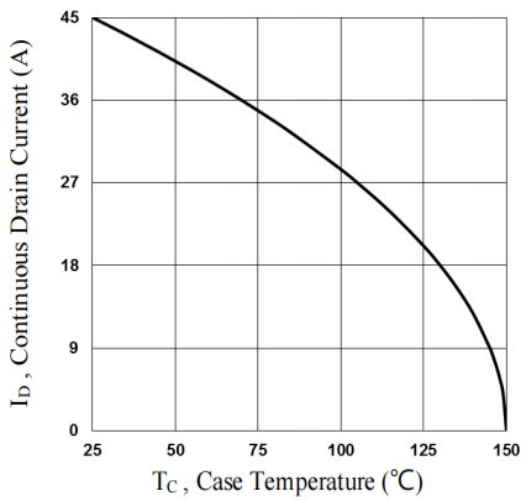


Fig2: Normalized $R_{DS(on)}$ vs. T_J

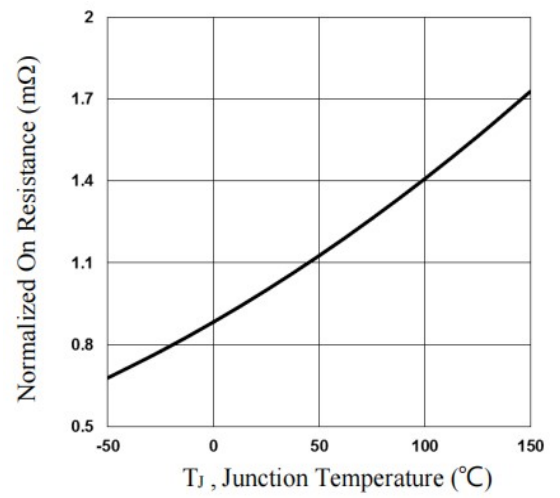


Fig.3 Normalized V_{th} vs. T_J

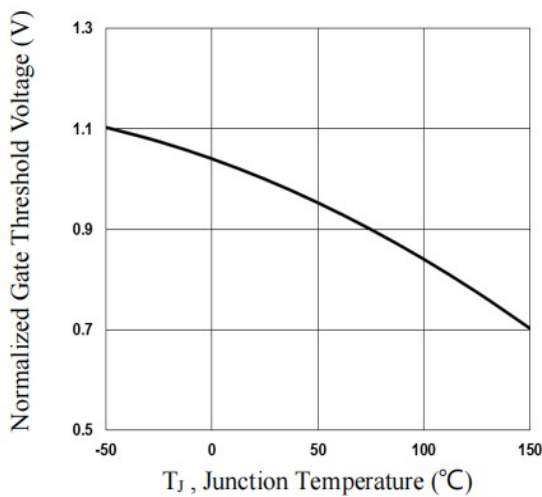


Fig.4 Gate Charge Waveform

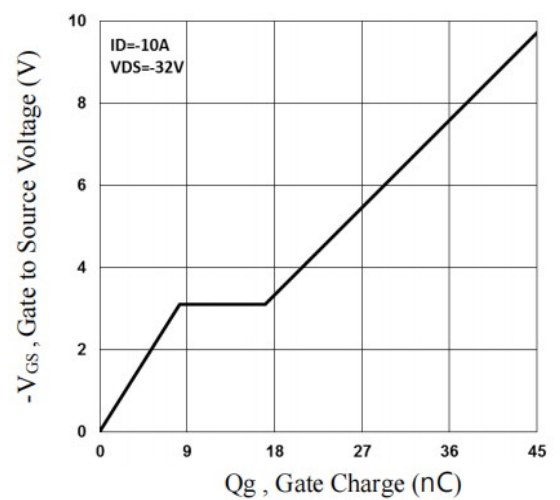


Fig.5 Normalized Transient Impedance

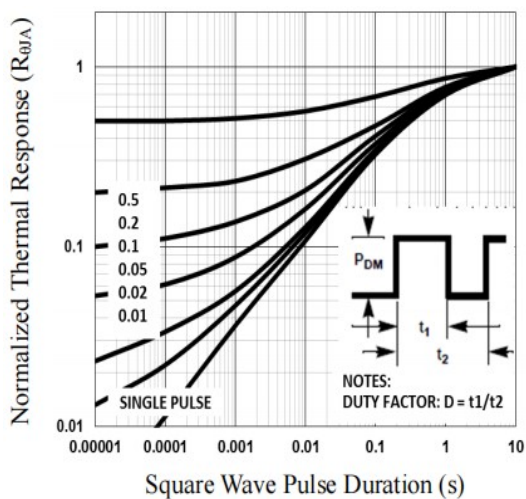


Fig.6 Maximum Safe Operation Area

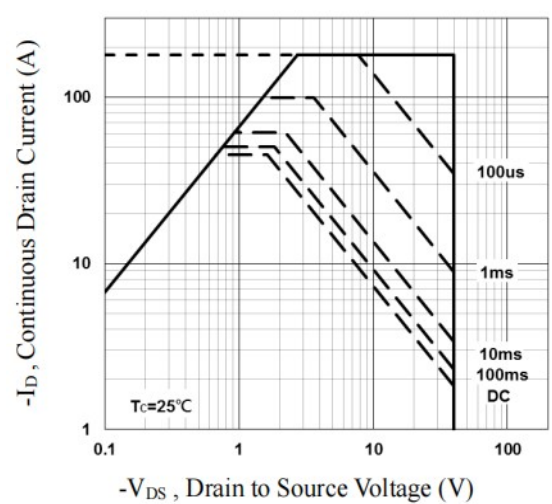




Fig. 7 Switching Time Waveform

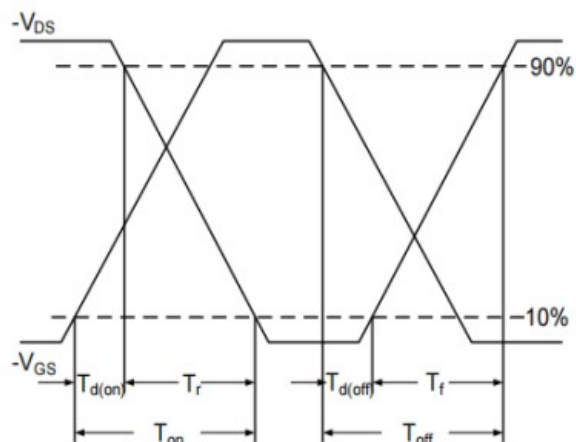
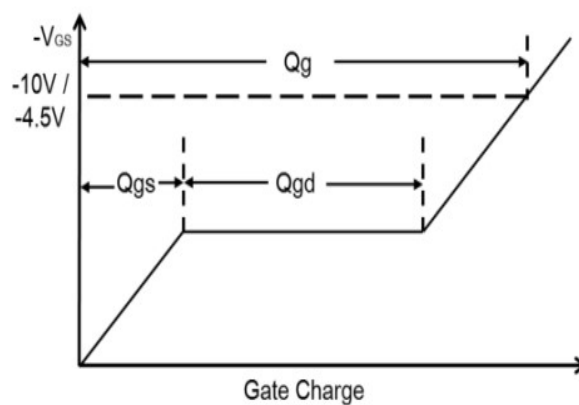
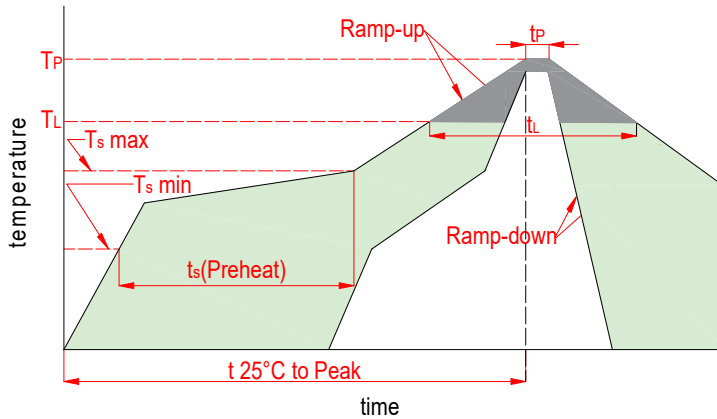


Fig.8 Gate Charge Waveform



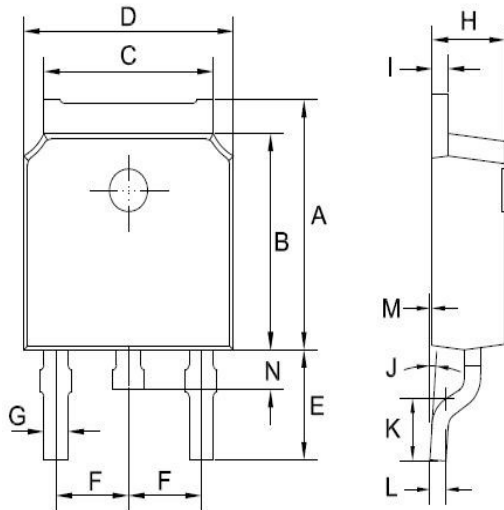


6. Soldering Parameters



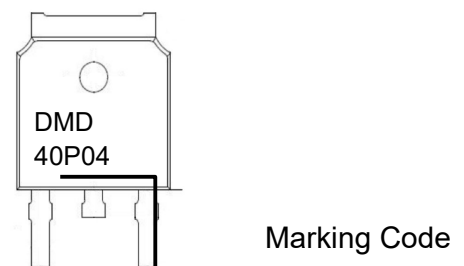
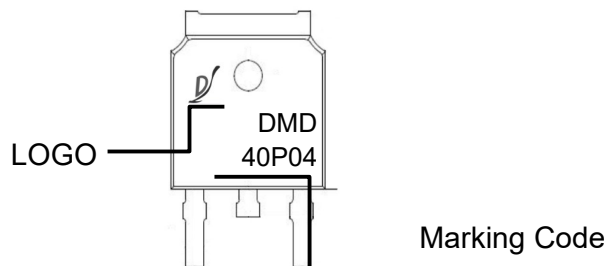
Reflow Condition		Lead-free
Pre Heat	Temp. min(T_s (min))	150℃
	Temp. max(T_s (min))	200℃
	Time(min to max)(t_s)	60~180s
Aver. ramp up rate(Liquidus Temp.)(T_L)to peak		3℃/s max
T_s (max) to T_L -Ramp-up Rate		3℃/s max
Reflow	Temp.(T_L)(Liquidus)	217℃
	Temp.(t_L)(Liquidus)	60~150s
Peak Temp.(T_P)		260 ^{+0/-5} ℃
Time within actual peak Temp.(t_p)		30s max
Ramp-down Rate		6℃/s max
Time 25℃ to peak Tempe.(T_P)		8 minutes max
Do not exceed		260℃

7. Dimensions



Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.270	0.285	6.85	7.25
B	0.232	0.248	5.90	6.30
C	0.202	0.218	5.13	5.53
D	0.252	0.268	6.40	6.80
E	0.114	0.130	2.90	3.30
F	0.086	0.094	2.19	2.39
G	0.018	0.033	0.45	0.85
H	0.087	0.094	2.20	2.40
I	0.016	0.024	0.41	0.61
J	0°	8°	0°	8°
K	0.057	0.073	1.45	1.85
L	0.016	0.024	0.41	0.61
M	0.000	0.005	0.00	0.12
N	0.024	0.039	0.60	1.00

8. Part Marking System



9. Package Information

Package	Part Number	Marking Code
TO-252	DMD40P04	DMD40P04



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