



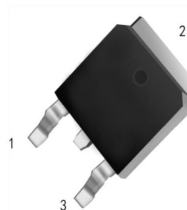
1.Features

- V_{DS} 40V
- I_D 70A
- $R_{DS(on)}$ (at $V_{GS}=10V$ $I_D=8A$) 6.5 Ω (Typ)
7.5 Ω (Max)

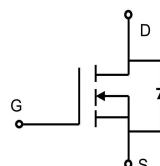
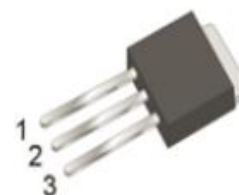
2.Mechanical Data

- Case:Molded Plastic,TO-252 TO-251L;
- Epoxy:UL 94V-0 rate flame retardant
- Terminals:Plated Leads Solderable per MIL-STD-750,Method-2026.
- Marking: marked on body.
- Mounting Position : Any.

TO-252



TO-251



1. Gate
2. Drain
3. Source

3.Maximum Ratings and Electrical Characteristics

Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Characteristics		Symbol	Ratings	Unit	
Drain-Source Voltage		V _{DS}	40	V	
Gate-Source Voltage		V _{GS}	±20	V	
Drain Current-Continuous	T _C =25°C	I _D	70	A	
	T _C =100°C		35.6		
Drain Current – Pulsed(Note 1)		I _{DM}	200	A	
Power Dissipation		P _D	54	W	
Junction Temperature		T _J	-55 to +150	°C	
Junction and Storage Temperature Range		T _{stg}	-55 to +150	°C	
Thermal Characteristics					
Parameter		Symbol	Typ	Max	Unit
Thermal Resistance, Junction-to-Case		R _{θJC}	-	62	°C/W
Thermal Resistance, Junction-to-Ambient		R _{θJA}	-	2.3	°C/W



Characteristics	Symbol	Test conditions	Min	TYP	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V,I _D =250μA	40	-	-	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V, T _J =25°C	-	-	1	uA
		V _{DS} =32V, V _{GS} =0V, T _J =85°C	-	-	10	uA
Forward Transconductance	g _{fs}	V _{DS} =10V, I _D =10A	-	13	-	s
Gate-Source Leakage Current	I _{GSS}	V _{GS} = 20V	-	-	100	nA
Gate-Source Leakage Current	I _{GSS}	V _{GS} = -20V	-	-	-100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250μA	1.2	1.8	2.5	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =8A	-	6.5	7.5	Ω
		V _{GS} =4.5V, ID=4A	-	9	12	
DYNAMIC PARAMETERS						
Input Capacitance	C _{iss}	V _{DS} =25V V _{GS} =0V f=1.0MHZ	-	1220	2200	pF
Output Capacitance	C _{oss}		-	130	250	
Reverse Transfer Capacitance	C _{rss}		-	55	110	
Gate resistance	Rg	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	2.2	-	Ω
SWITCHING PARAMETERS						
Turn-off Delay Time	t _{d(off)}	V _{DD} =15V,R _D =3.3Ω; V _{DD} =10V; I _D =1A (Note 2.3)	-	13.2	25	ns
Rise Time	T _r			2.2	5	
Turn-Off Delay Time	T _{d(off)}			72	130	
Fall Time	T _f			4.5	10	
Total Gate Charge	Q _g	V _{DS} =20V, I _D =8A V _{GS} =4.5V(Note 2.3)	-	12.2	24	nC
Gate-Source Charge	Q _{gs}		-	3.3	7	
Gate-Drain Charge	Q _{gd}		-	6.7	13	
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Continuous Source Current	I _S		-	-	70	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V , I _S =1A , T _J =25°C	-	-	1	V
Reverse Recovery Time	T _{rr}	I _S =1A,Tj=25°C	-	17	-	ns
Reverse Recovery Charge	Q _{rr}	dI/dt=100A/μS(Note 3)	-	2.8	-	nC

Notes:

- 1.Repetitive Rating : Pulsed width limited by maximum junction temperature.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 3.Essentially independent of operating temperature.



4. Rating And Characteristic Curves

Fig.1 Continuous Drain Current vs. T_C

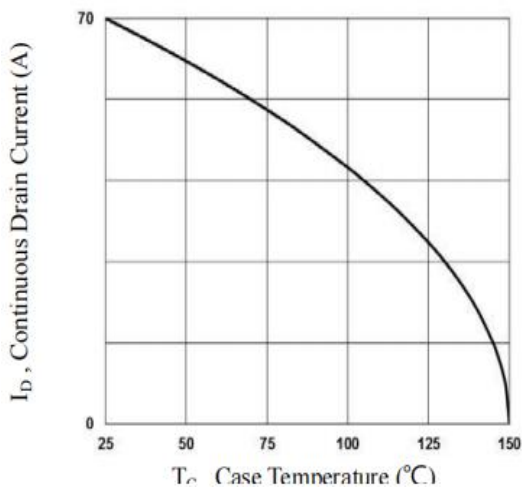


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

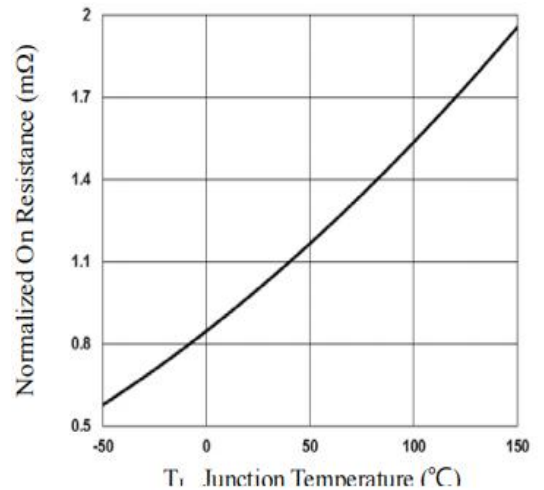


Fig.3 Normalized V_{th} vs. T_J

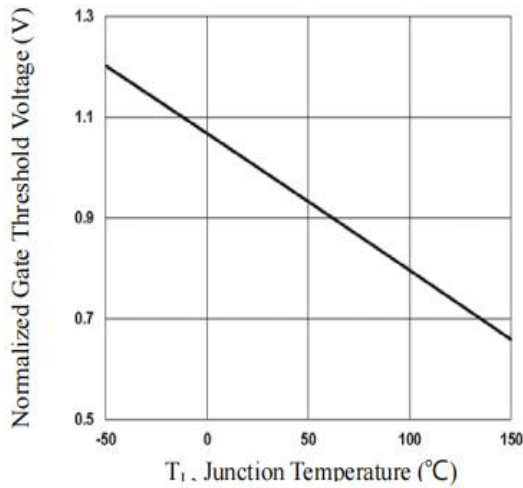


Fig.4 Gate Charge Waveform

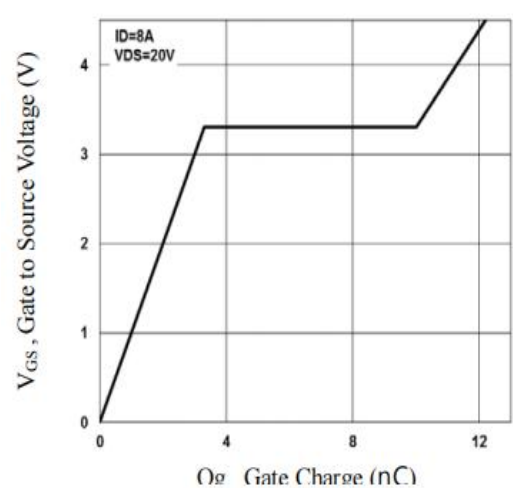


Fig.5 Normalized Transient Impedance

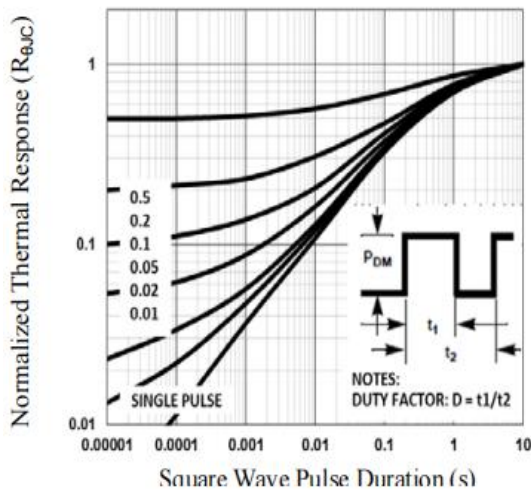
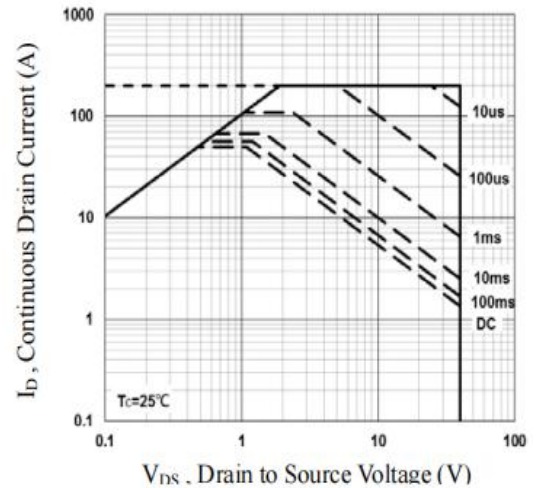
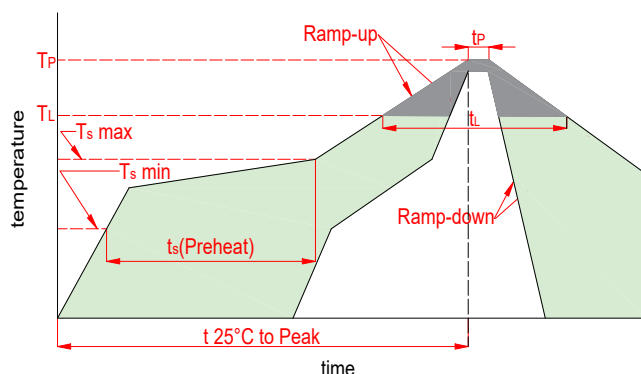


Fig.6 Maximum Safe Operation Area



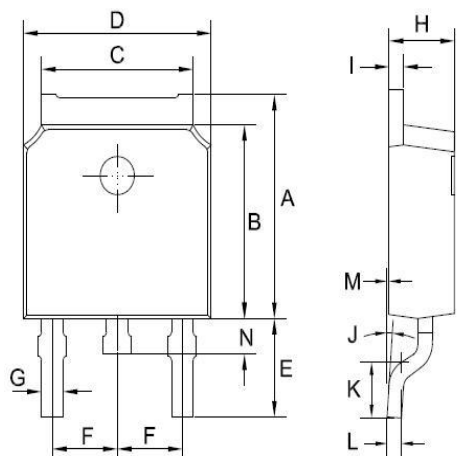


5. Soldering Parameters

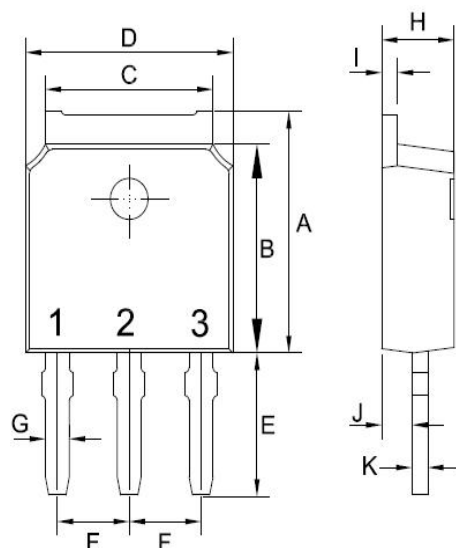


Reflow Condition		Lead-free
Pre Heat	Temp. min(T_s (min))	150°C
	Temp. max(T_s (min))	200°C
	Time(min to max)(t_s)	60~180s
Aver. ramp up rate(Liquidus Temp.)(T_L)to peak		3°C/s max
T_s (max) to T_L -Ramp-up Rate		3°C/s max
Reflow	Temp.(T_L)(Liquidus)	217°C
	Temp.(t_L)(Liquidus)	60~150s
Peak Temp.(T_P)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

6.Dimensions



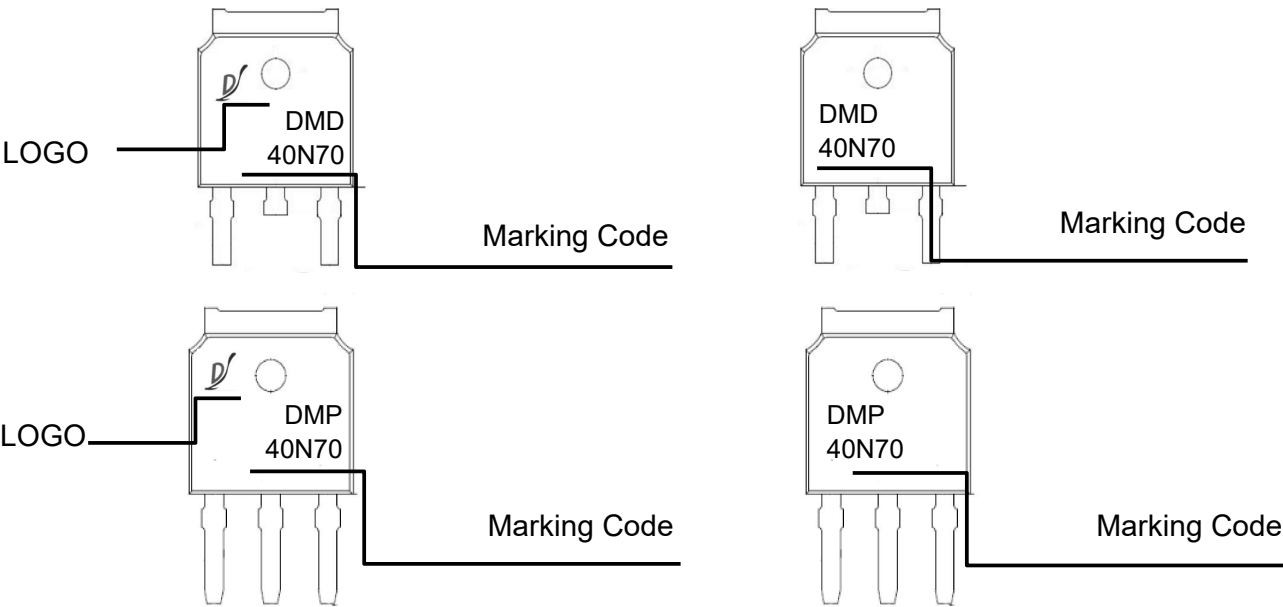
Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.270	0.295	6.85	7.50
B	0.209	0.248	5.30	6.30
C	0.201	0.218	5.10	5.53
D	0.248	0.268	6.30	6.80
E	0.110	0.130	2.80	3.30
F	0.086	0.094	2.19	2.39
G	0.018	0.033	0.45	0.85
H	0.087	0.098	2.20	2.50
I	0.016	0.028	0.41	0.70
L	0.016	0.028	0.41	0.70
M	0.000	0.009	0.00	0.23
N	0.024	0.043	0.60	1.10



Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.270	0.295	6.85	7.50
B	0.209	0.248	5.30	6.30
C	0.201	0.218	5.10	5.53
D	0.248	0.268	6.30	6.80
E	0.156	0.171	3.95	4.35
F	0.086	0.133	2.19	3.39
G	0.028	0.035	0.70	0.90
H	0.087	0.094	2.20	2.40
I	0.016	0.024	0.41	0.61
J	0.028	0.052	0.71	1.31
K	0.016	0.024	0.41	0.61



7. Part Marking System



8. Package Information

Package	Part Number
TO-252	2500



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