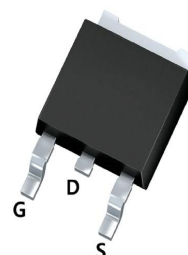




1.Features

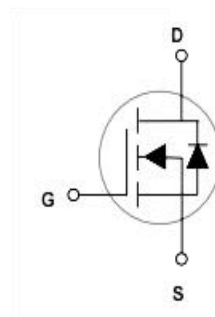
- V_{DS} 40V
- I_D (at $V_{GS}=10V$) 100A
- $R_{DS(on)}$ (at $V_{GS}=10V$) 1.9m Ω (Typ)

TO-252



2.Mechanical Data

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



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	100		A
	T _C =100°C		82		
Maximum Power Dissipation		P _D	125		W
Single Pulsed Avalanche energy ⁽¹⁾		E _{AS}	400		mJ
Junction and Storage Temperature Range		T _J , T _{stg}	-55 to +150		°C
Thermal Characteristics					
Parameter		Symbol	Typ	Max	Unit
Thermal Resistance, Junction-to-Case ¹		R _{θJC}	-	1	°C/W
Thermal Resistance, Junction-to-Ambient ¹		R _{θJA}	-	50	°C/W



Characteristics	Symbol	Test conditions	Min	TYP	Max	Unit
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V,I _D =250μA	40	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 32V,V _{GS} = 0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V,V _{DS} = 0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250μA	1.2	1.6	2.2	V
Drain-Source On-State Resistance ²	R _{DS(on)}	V _{GS} =10V, I _D =20A	-	1.9	2.4	mΩ
		V _{GS} =4.5V, I _D =20A	-	2.5	3.6	
DYNAMIC PARAMETERS						
Input Capacitance	C _{iss}	V _{DS} =20V	-	3972	4650	pF
Output Capacitance	C _{oss}	V _{GS} =0V	-	1119	1310	
Reverse Transfer Capacitance	C _{rss}	f=1.0MHZ	-	82	105	
SWITCHING PARAMETERS						
Turn-on Delay Time	t _{d(on)}	V _{DS} =15V, V _{GS} =10V R _G =3.3Ω; I _D =20AΩ;	-	18.5	23	nS
Turn-on Rise Time	t _r		-	9	12	
Turn-off Delay Time	t _{d(off)}		-	58.5	70	
Turn-off Fall Time	t _f		-	32	39	
Total Gate Charge	Q _g	V _{DS} =15V, I _D =20A V _{GS} =10V	-	90	108	nC
Gate-Source Charge	Q _{gs}		-	12	15	
Gate-Drain Charge	Q _{gd}		-	18.5	24	
Diode Forward Voltage ²	V _{SD}	I _{SD} =20A,V _{GS} =0V	-	-	1.2	V
Gate resistance	R _g	V _{GS} =0V, V _{DS} =0V,F=1MHz	-	1.0	2.5	Ω
Continuous Source Current ^{1,6}	I _s	V _G =V _D =0V , Force Current	-	-	100	A

Notes:

1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

3.The EAS data shows Max. rating . The test condition is

 $V_{DD}=25V, V_{GS}=10V, L=0.5mH, I_{AS}=40A$

4.The power dissipation is limited by 150℃ junction temperature

5.The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

6.Package limitation current is 100A.



4.Rating And Characteristic Curves

Fig.1 Typical Output Characteristics

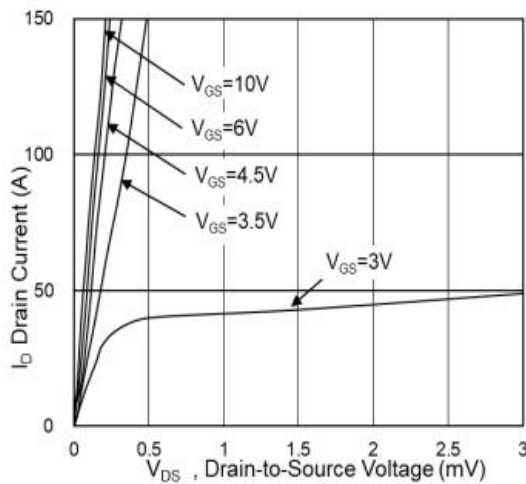


Fig.2 On-Resistance vs G-S Voltage

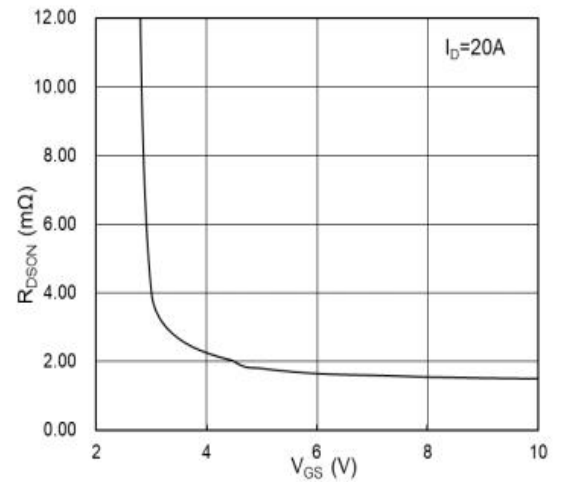


Fig.3 Source Drain Forward Characteristics

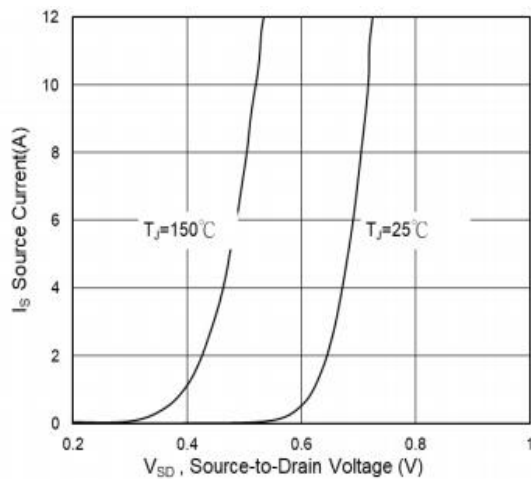


Fig.4 Gate-Charge Characteristics

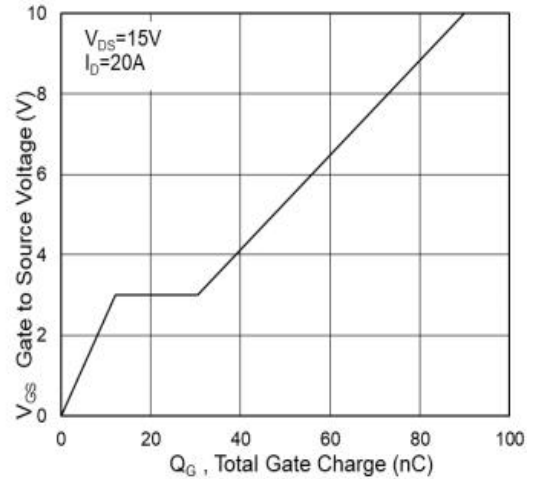


Fig. 5 Normalized $V_{GS(th)}$ vs T_J

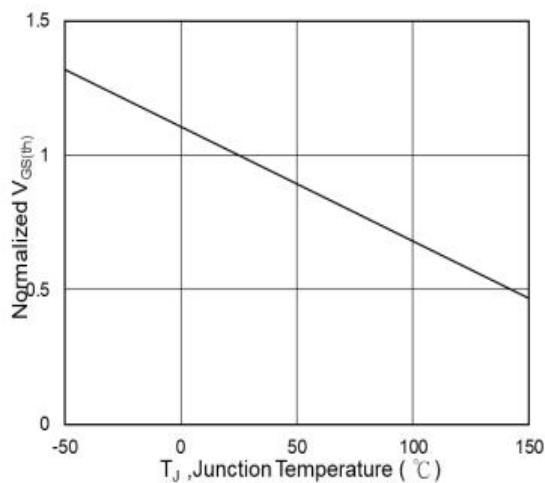


Fig.6 Normalized $R_{DS(on)}$ vs T_J

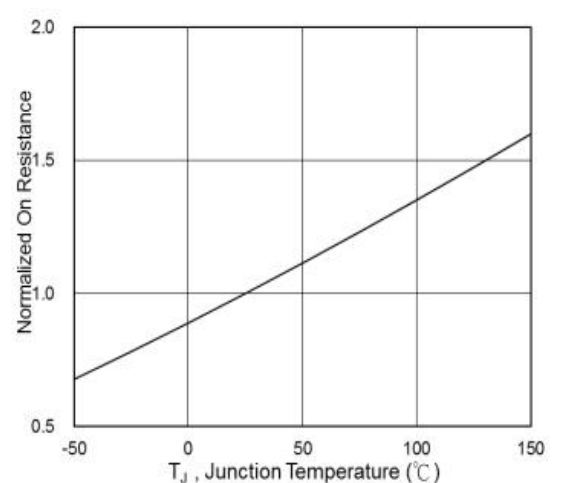




Fig.7 Capacitance

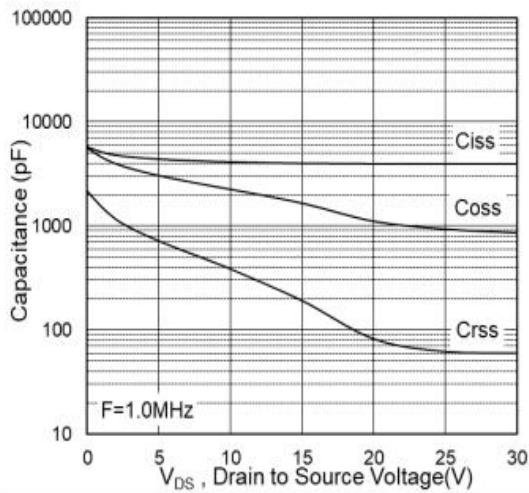


Fig.8 Safe Operating Area

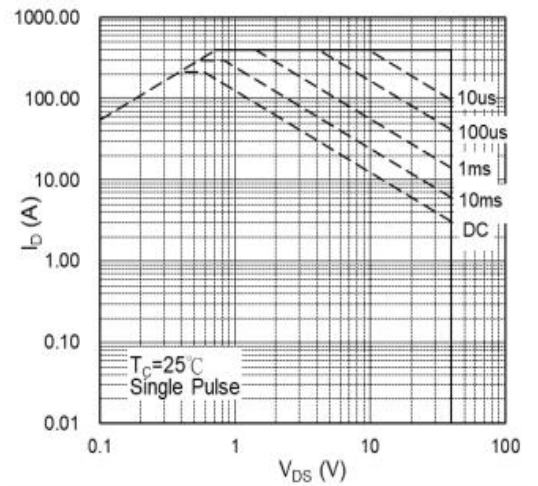


Fig 9 Capacitance

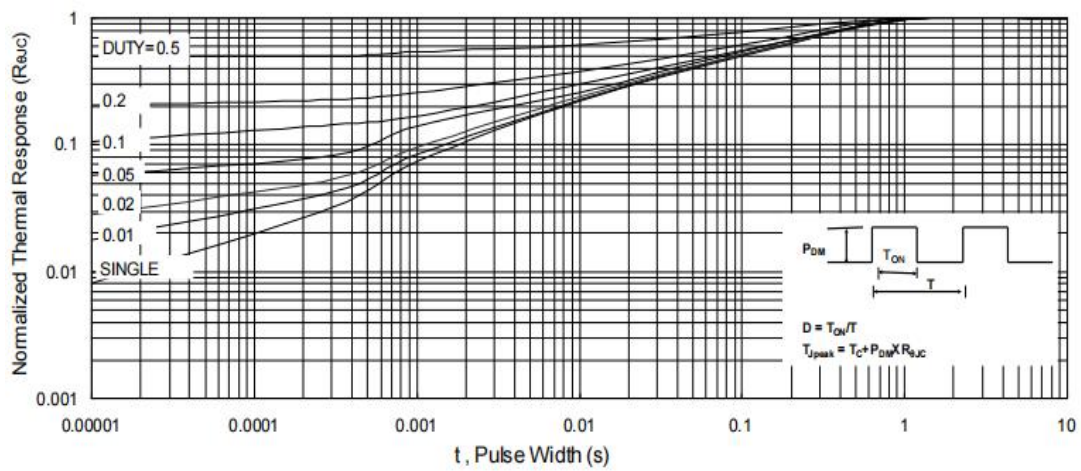


Fig.10 Switching Time Waveform

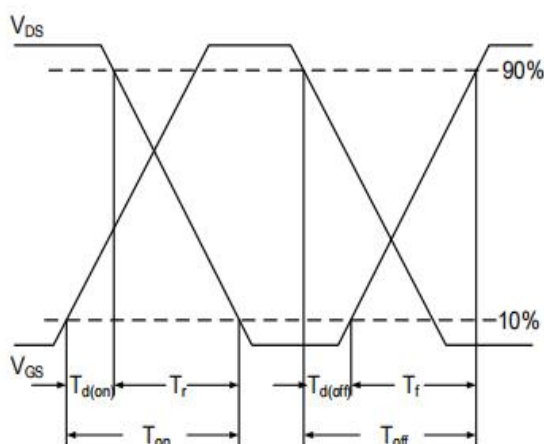
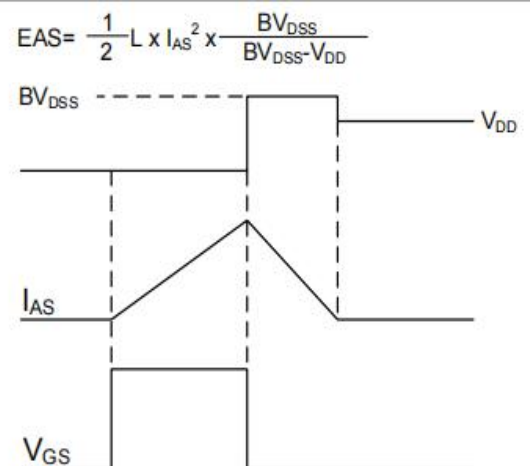
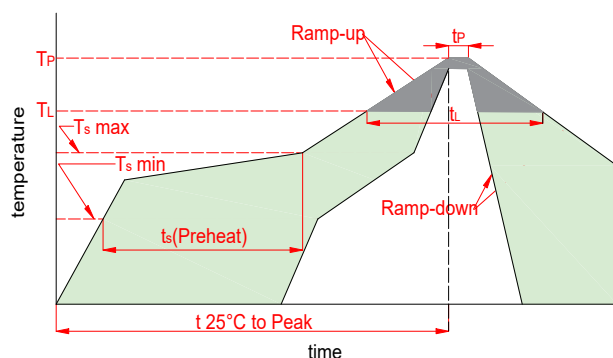


Fig.11 Unclamped Inductive Switching Waveform



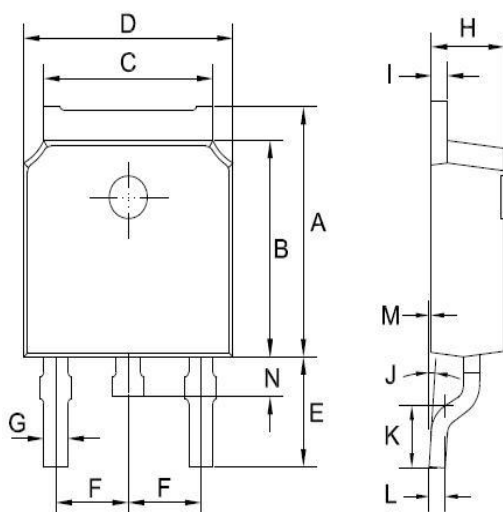


5. Soldering Parameters



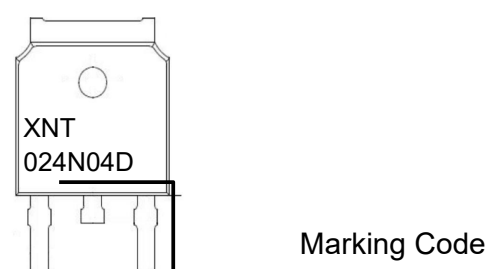
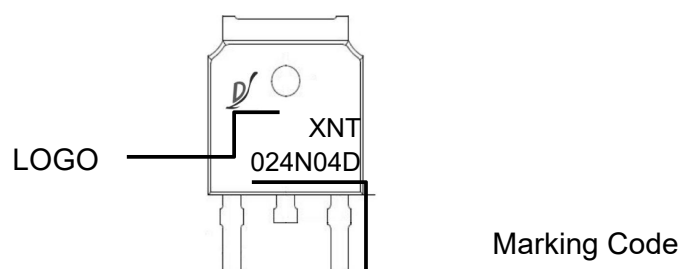
Reflow Condition		Lead-free
Pre Heat	Temp. min(T_s (min))	150℃
	Temp. max(T_s (min))	200℃
	Time(min to max)(t_s)	60~180s
Aver. ramp up rate(Liquidus Temp.)(T_L)to peak		3℃/s max
T_s (max) to T_L -Ramp-up Rate		3℃/s max
Reflow	Temp. (T_L)(Liquidus)	217℃
	Temp. (t_L)(Liquidus)	60~150s
Peak Temp. (T_P)		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℃

6.Dimensions



Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.270	0.285	6.85	7.25
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	0.114	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	0.098	2.20	2.50
I	0.016	0.028	0.41	0.70
K	0.035	0.073	0.90	1.85
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

7.Test circuits



8. Package Information

Package	Quantity(pcs)
TO-252	2500



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