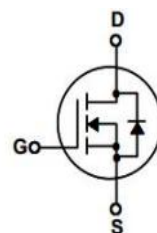
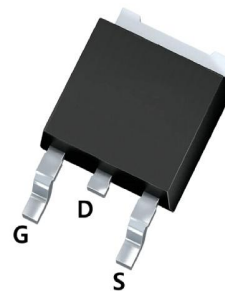




1.Features

- $R_{DS(ON)} \leq 38m\Omega$ @ $V_{GS}=10V$, $I_D=15A$
- Ultra Low On-Resistance
- Lead free product is acquired
- Fast Switching

TO-252



1. Gate
2. Drain
3. Source

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.

3.Maximum Ratings and Electrical Characteristics

Rating at 25°C Ambient temperature unless otherwise specified

Characteristics		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	100	V
Drain Current Continuous	$T_C=25^{\circ}C$	I_D	33	A
	$T_C=100^{\circ}C$		23	
Drain Current Pulsed(Note 1)		I_{DM}	132	A
Gate-Source Voltage		V_{GS}	± 20	V
Power Dissipation($T_C=25^{\circ}C$)		P_D	110	W
Single Pulsed Avalanche Energy		E_{AS}	334	mJ
Maximum Junction Temperature		T_J	150	$^{\circ}C$
Storage Temperature Range		T_{stg}	-55 to +150	$^{\circ}C$
Thermal Resistance, Junction-to-Case		$R_{\theta JC}$	1.14	$^{\circ}C/W$



Characteristics	Symbol	Test conditions	Min	TYP	Max	Unit
Off Characteristics						
Drain -Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V,I _D =250μA	100	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 100V,V _{GS} = 0V	-	-	1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} = 20V	-	-	100	nA
Gate-Source Leakage Current		V _{GS} = -20V	-	-	-100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS (th)}	V _{GS} = V _{DS} , I _D =250μA	2	3	4	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =15A	-	37	40	mΩ
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =25V V _{GS} =0V f=1.0MHZ	-	1330	-	pF
Output Capacitance	C _{oss}		-	275	-	
Reverse Transfer Capacitance	C _{rss}		-	88	-	
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} =50V, V _{GS} =10V R _G =1Ω; I _D =10A	-	38	-	ns
Turn-on Rise Time	t _r		-	44	-	
Turn-off Delay Time	t _{d(off)}		-	206	-	
Turn-off Fall Time	t _f		-	62	-	
Total Gate Charge	Q _g	V _{DS} =80V, V _{GS} =10A I _D =33A	-	52	-	nC
Gate-Source Charge	Q _{gs}		-	6	-	
Gate-Drain Charge	Q _{gd}		-	28	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	I _S =30A,V _{GS} =0V	-	-	1.2	V
Continuous Source Current	I _S		-	-	100	A
Pulsed Source Current	I _{SM}		-	-	400	
Reverse Recovery Time	T _{rr}	I _F =20A,	-	28.3	-	ns
Reverse Recovery Charge	Q _{rr}	dI/dt=100A/μS	-	21.2	-	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Essentially independent of operating temperature



4. Rating And Characteristic Curves

Fig.1 Output Characteristics

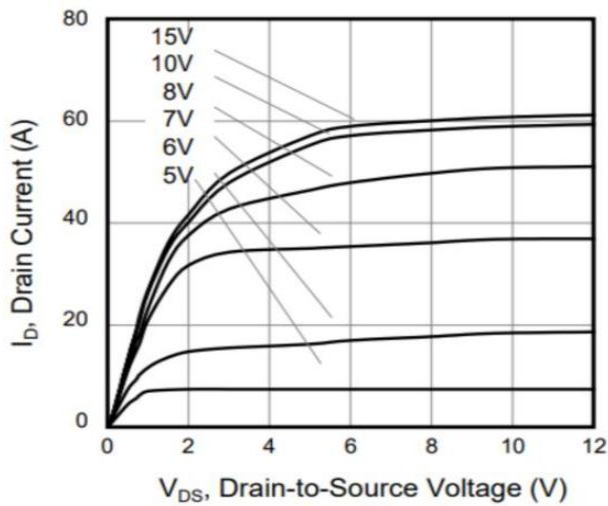


Fig.2 Body Diode Forward Voltage

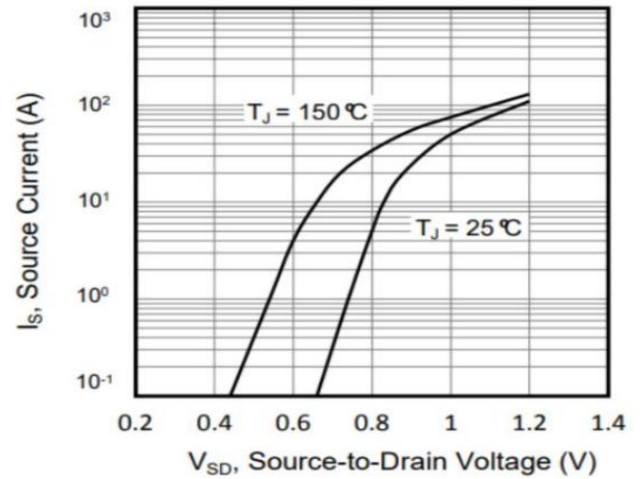


Fig.3 Drain Current vs. Temperature

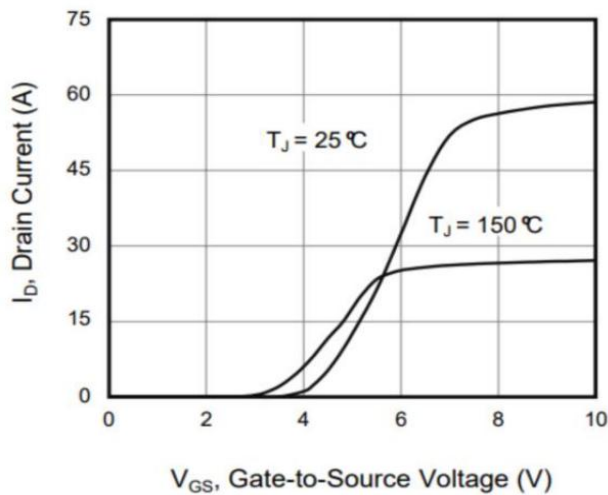


Fig.4 BV_{DSS} Variation vs. Temperature

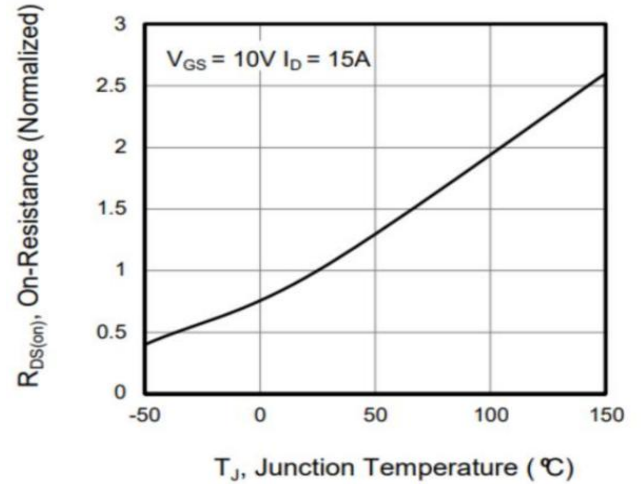


Fig.5 Transfer Characteristics

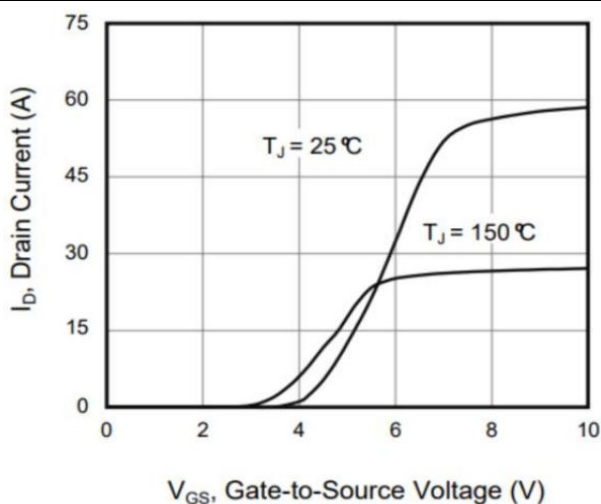


Fig.6 On-Resistance vs. Temperature

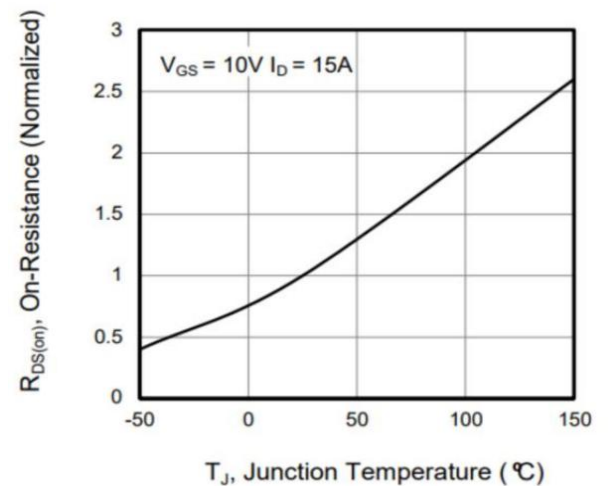




Fig.7 Capacitance

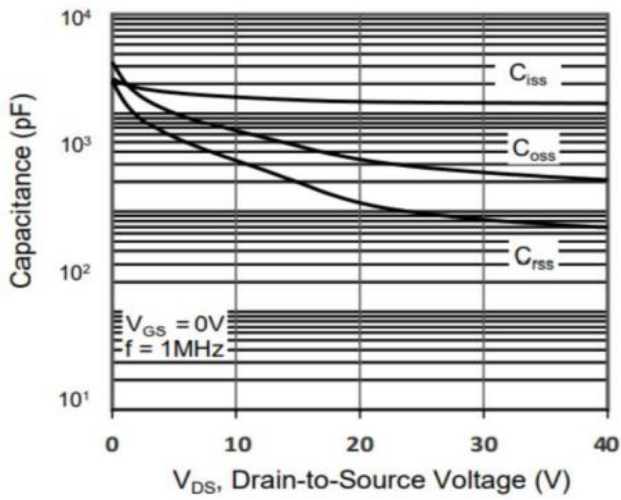


Fig.8 Gate Charge

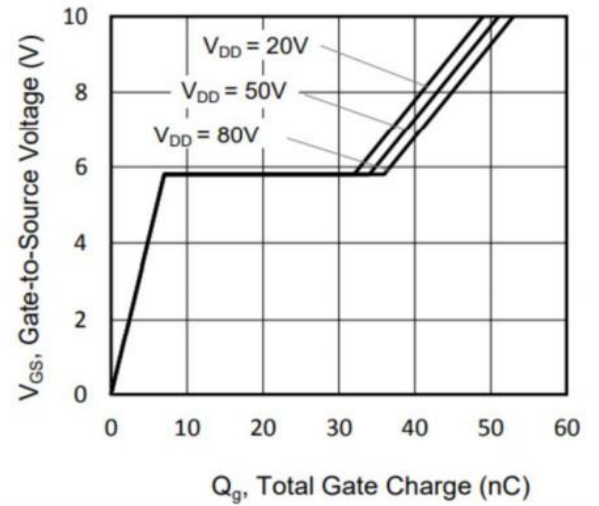
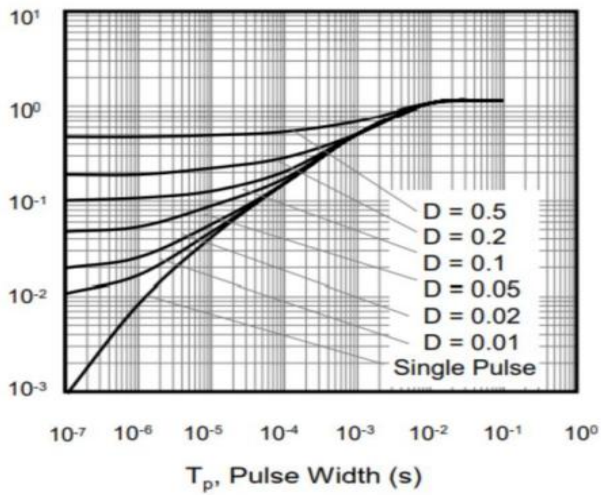
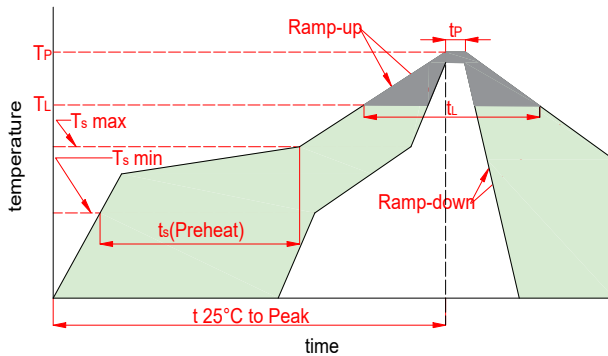


Fig.9 Effective Transient Thermal Impedance



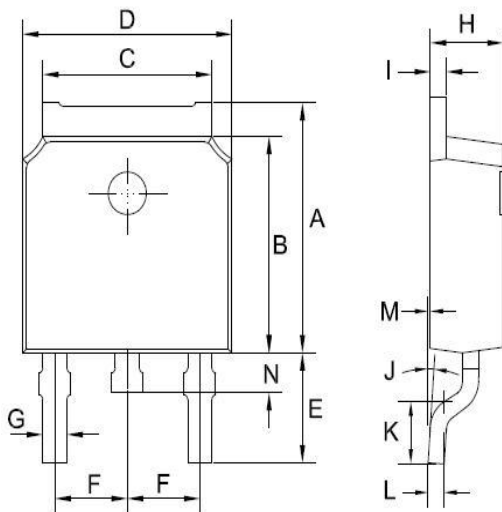


5. Soldering Parameters



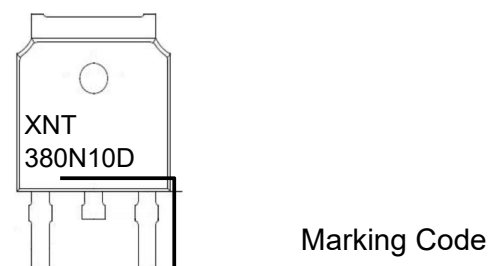
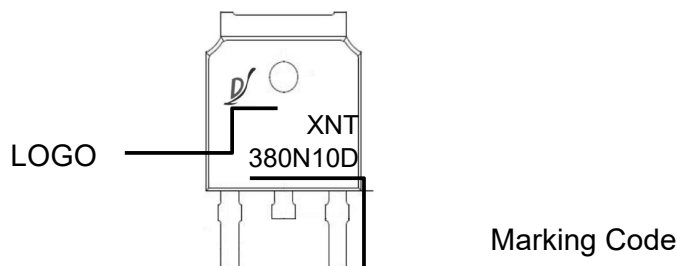
Reflow Condition		Lead-free
Pre Heat	Temp. min(T_s (min))	150℃
	Temp. max(T_s (min))	200℃
	Time(min to max)(t_s)	60~180s
Aver. ramp up rate(Liquidus Temp.)(T_L)to peak		3℃/s max
T_s (max) to T_L -Ramp-up Rate		3℃/s max
Reflow	Temp.(T_L)(Liquidus)	217℃
	Temp.(t_L)(Liquidus)	60~150s
Peak Temp.(T_P)		260 ^{+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	0.232	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

7. Part Marking System

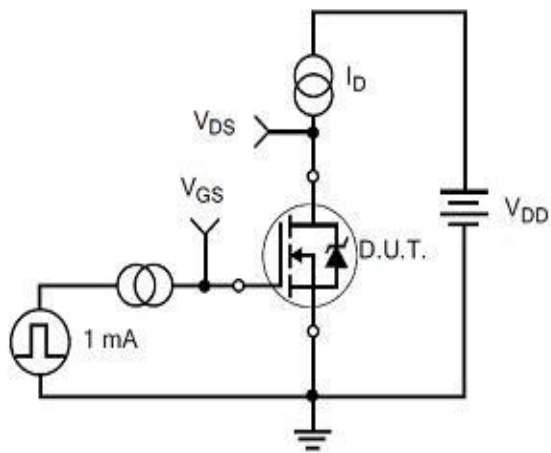


8. Package Information

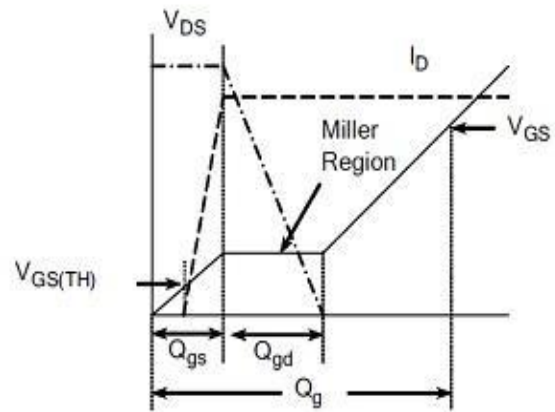
Package	Part Number	Marking Code
TO-252	2500	XNP380N10D



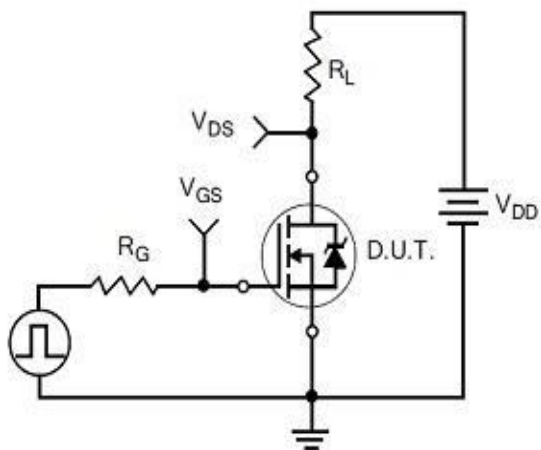
9. Test circuits



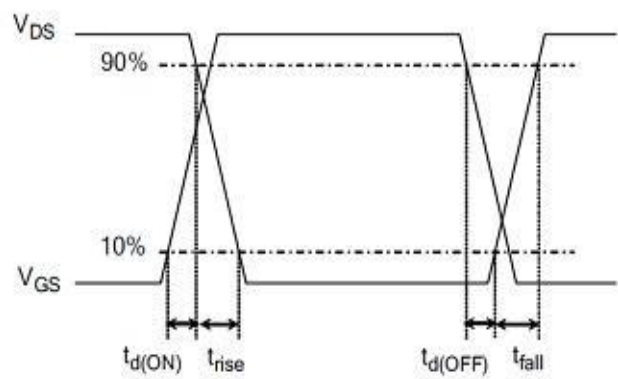
Gate Charge Test Circuit



Gate Charge Waveform



Resistive Switching Test Circuit



Resistive Switching Waveforms

[illegible]

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