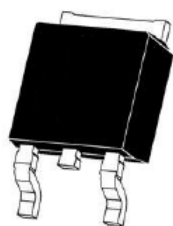
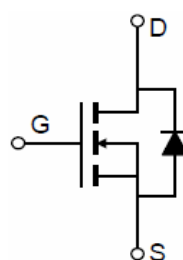


Features

- Enhancement mode
- Very low on-resistance $R_{DS(on)}$ @ $V_{GS}=4.5\text{ V}$
- Fast Switching
- 100% Avalanche test
- Pb-free lead plating; RoHS compliant



TO-252-2L top view



Schematic diagram

Product Summary



V_{DS}	30	V
$R_{DS(on),TYP}$ @ $V_{GS}=10\text{ V}$	2.5	m Ω
I_D	120	A

Maximum ratings, at $T_A = 25^\circ\text{C}$, unless otherwise specified

Symbol	Parameter	Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage	30	V
I_S	Diode continuous forward current	$T_C = 25^\circ\text{C}$ 120	A
I_D	Continuous drain current @ $V_{GS}=10\text{V}$	$T_C = 25^\circ\text{C}$ 120	A
		$T_C = 100^\circ\text{C}$ 80	A
I_{DM}	Pulse drain current tested ①	$T_C = 25^\circ\text{C}$ 480	A
EAS	Avalanche energy, single pulsed ②	100	mJ
P_D	Maximum power dissipation	$T_C = 25^\circ\text{C}$ 45	W
V_{GS}	Gate-Source voltage	± 20	V
$T_{STG} T_J$	Storage and operating temperature range	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	2.4	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	62	$^\circ\text{C/W}$

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_j=25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =250μA	30	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V, V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T _j =85°C	V _{DS} =24V, V _{GS} =0V	--	--	30	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	1.5	2.5	V
R _{DS(ON)}	Drain-Source On-State Resistance ^③	V _{GS} =10V, I _D =30A	--	2.5	3.5	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance ^③	V _{GS} =4.5V, I _D =30A	--	3.9	4.5	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	--	2921	--	pF
C _{oss}	Output Capacitance		--	440	--	pF
C _{rss}	Reverse Transfer Capacitance		--	416	--	pF
R _g	Gate Resistance	f=1MHz	--	1.2	--	Ω
Q _g	Total Gate Charge	V _{DS} =15V, I _D =20A, V _{GS} =10V	--	63	--	nC
Q _{gs}	Gate-Source Charge		--	13	--	nC
Q _{gd}	Gate-Drain Charge		--	16	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =20V, I _D =20A, R _G =3Ω, V _{GS} =10V	--	14	--	nS
t _r	Turn-on Rise Time		--	18	--	nS
t _{d(off)}	Turn-Off Delay Time		--	99	--	nS
t _f	Turn-Off Fall Time		--	45	--	nS
Source- Drain Diode Characteristics @ T_j = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	I _{SD} =20A, V _{GS} =0V	--	0.79	1.2	V
t _{rr}	Reverse Recovery Time	T _j =25°C, I _{SD} =20A, V _{GS} =0V	--	32	--	nS
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs		31		nC

NOTE:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.5mH, R_G = 25Ω, I_{AS} = 20A, V_{GS} = 10V. Part not recommended for use above this value
- ③ Pulse width ≤ 300μs; duty cycle ≤ 2%.

Typical Characteristics

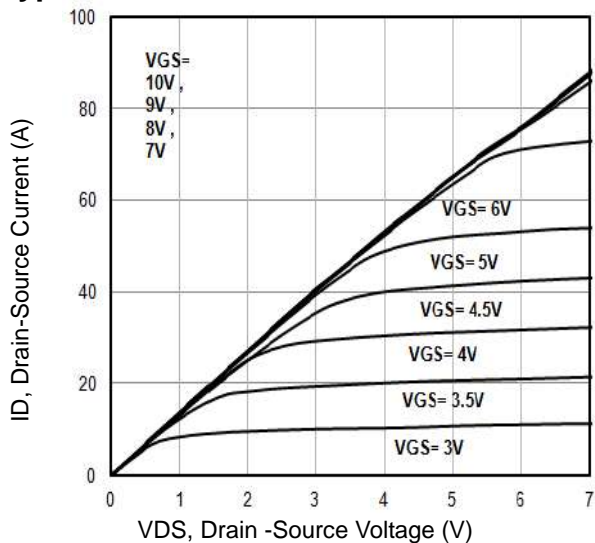


Fig1. Typical Output Characteristics

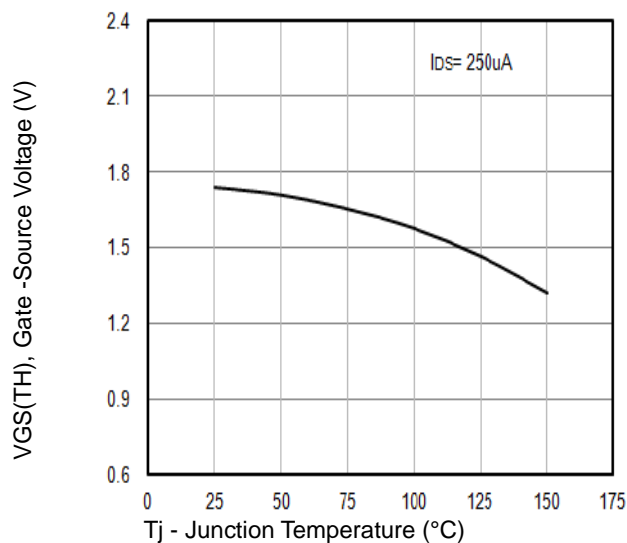


Fig2. $V_{GS(TH)}$ Gate-Source Voltage (V) vs. T_j - Junction Temperature ($^{\circ}C$)

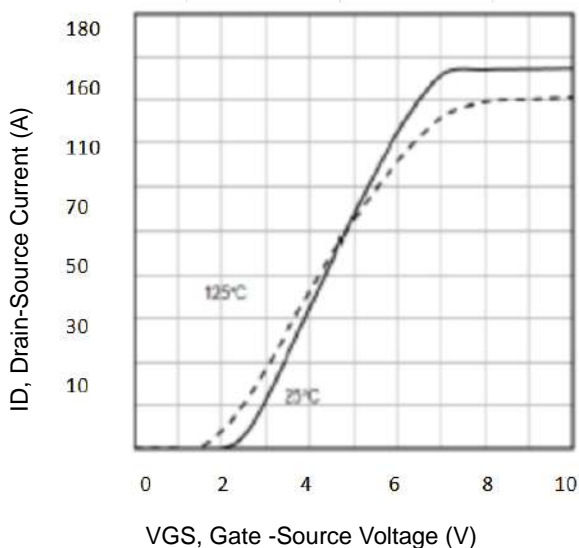


Fig3. Typical Transfer Characteristics

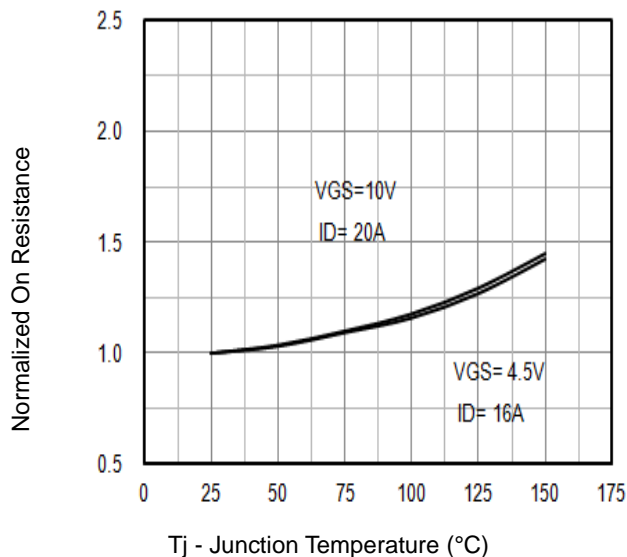


Fig4. Normalized On-Resistance Vs. T_j

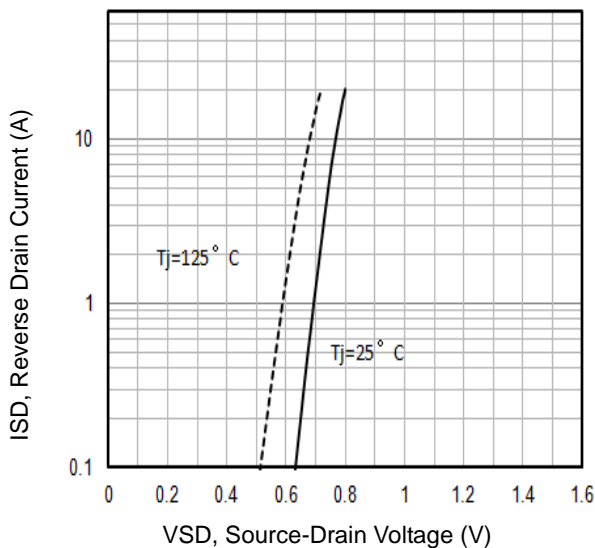


Fig5. Typical Source-Drain Diode Forward Voltage

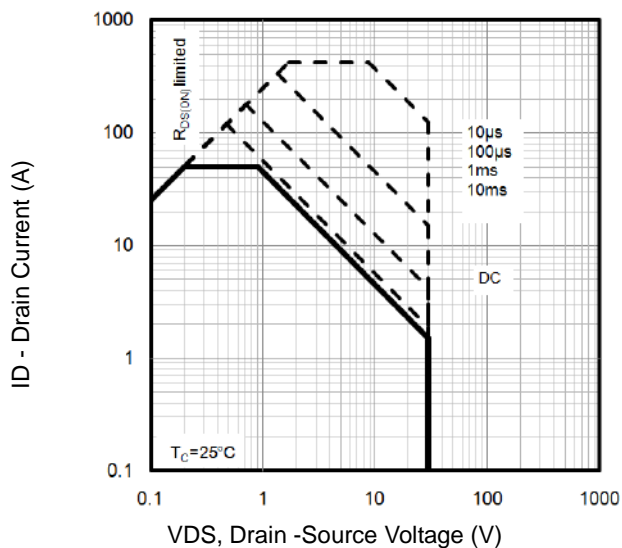


Fig6. Maximum Safe Operating Area

Typical Characteristics

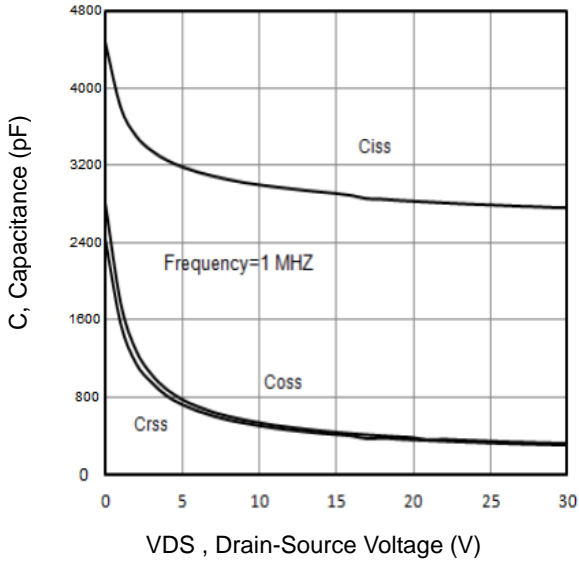


Fig7. Typical Capacitance Vs.Drain-Source Voltage

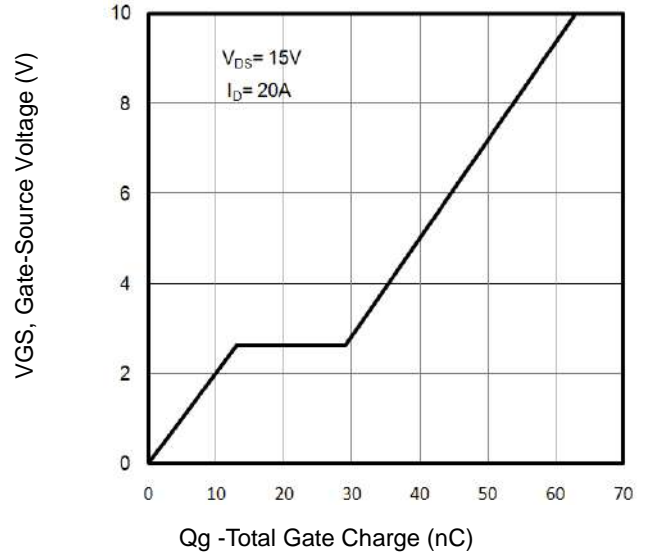


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

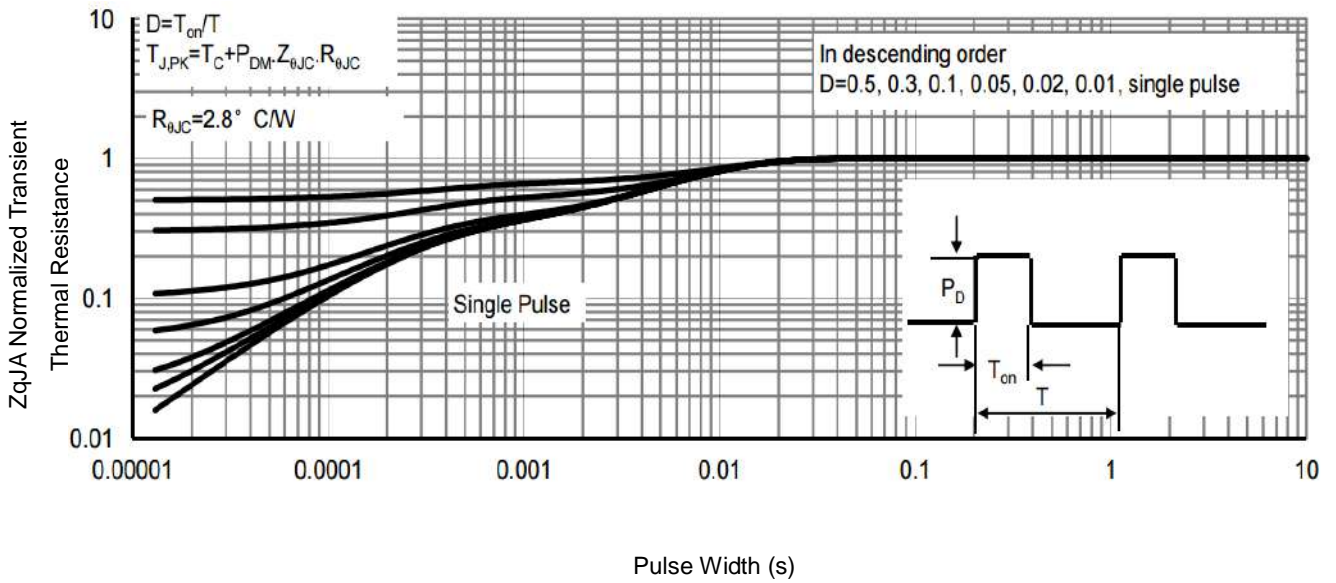


Fig9. Normalized Maximum Transient Thermal Impedance

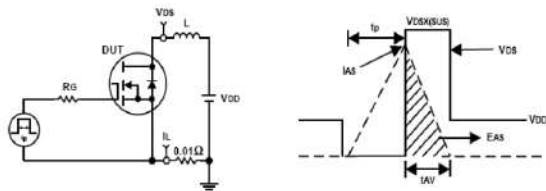


Fig10. Unclamped Inductive Test Circuit and waveforms

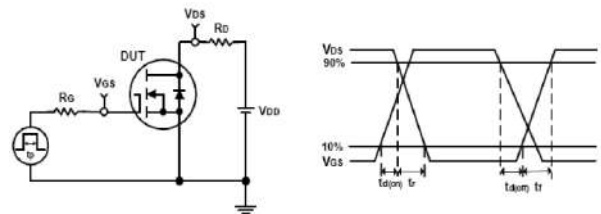
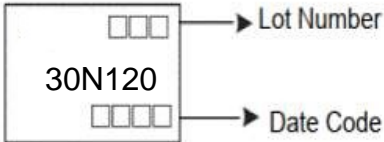


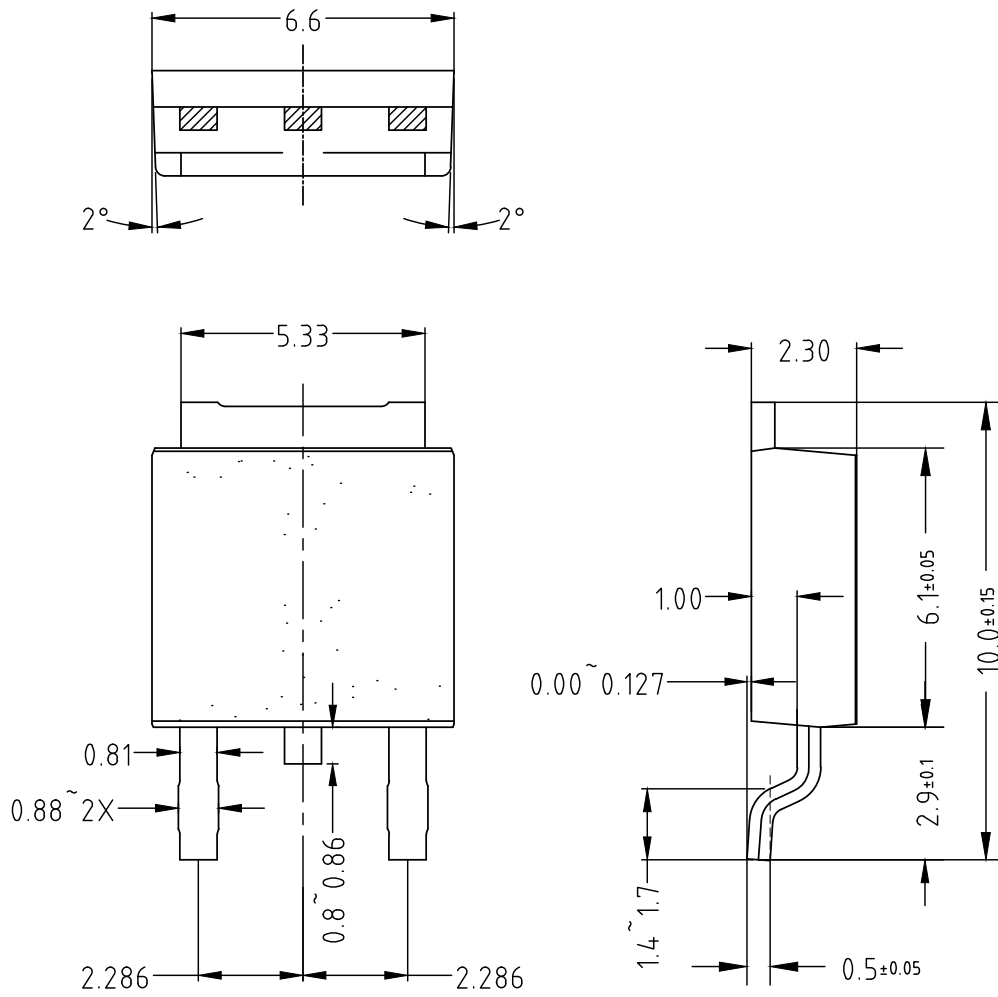
Fig11. Switching Time Test Circuit and waveforms

Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
JMD30N120KQ-R	30N120	TO-252	Tape&Reel	2500/Reel

PACKAGE	MARKING
TO-252	 <p>The diagram shows a rectangular marking area with the text '30N120' in the center. Above the text are three empty boxes, with an arrow pointing to the label 'Lot Number'. Below the text are four empty boxes, with an arrow pointing to the label 'Date Code'.</p>

TO-252



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