

30V N-Channel Mosfet

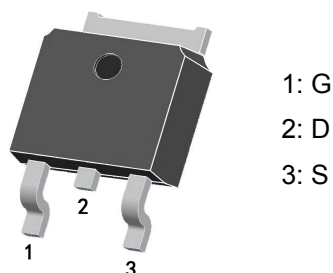
FEATURES

- $R_{DS(ON)} < 4m\Omega$ @ $V_{GS} = 10V$
- $R_{DS(ON)} < 6m\Omega$ @ $V_{GS} = 4.5V$

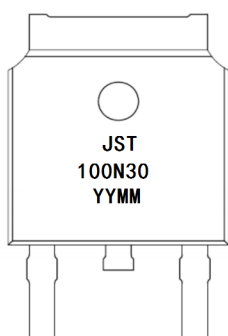
APPLICATIONS

- Load Switch
- PWM Application
- Power management

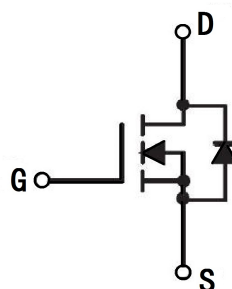
TO-252-2L



MARKING



N-CHANNEL MOSFET



YYMM:Date Code(year&month)

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		± 20	V
I_D	Continuous Drain Current	$T_C = 25^\circ\text{C}$	100	A
		$T_C = 100^\circ\text{C}$	65	A
I_{DM}	Pulsed Drain Current ^{note1}		400	A
E_{AS}	Single Pulsed Avalanche Energy ^{note2}		180	mJ
P_D	Power Dissipation	$T_C = 25^\circ\text{C}$	88	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.7	$^\circ\text{C}/\text{W}$
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +175	$^\circ\text{C}$

Electrical Characteristics (T_C=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} = 0V,	-	-	1.0	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D =250μA	1.0	1.6	2.5	V
R _{DS(on)}	Static Drain-Source on-Resistance note3	V _{GS} =10V, I _D =24A	-	3.1	4	mΩ
		V _{GS} =4.5V, I _D =12A	-	4.5	6	
g _{FS}	Forward Transconductance	V _{DS} =10V, I _D =10A	-	15.5	-	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f = 1.0MHz	-	2200	-	pF
C _{oss}	Output Capacitance		-	280	-	pF
C _{rss}	Reverse Transfer Capacitance		-	177	-	pF
Q _g	Total Gate Charge	V _{DS} =15V, I _D =24A, V _{GS} =10V	-	42	-	nC
Q _{gs}	Gate-Source Charge		-	4	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	13	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =15V, I _D =15A, R _{GEN} =3.3Ω, V _{GS} =10V	-	12.6	-	ns
t _r	Turn-on Rise Time		-	19.5	-	ns
t _{d(off)}	Turn-off Delay Time		-	42.8	-	ns
t _f	Turn-off Fall Time		-	13.2	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	100	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	400	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S =30A	-	-	1.2	V
t _{rr}	Body Diode Reverse Recovery Time	I _F =30A, dI/dt=100A/μs	-	19	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	11	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T_J=25°C, V_{DD}=25V, V_G=10V, R_G=25Ω

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

Typical Performance Characteristics

Figure1: Output Characteristics

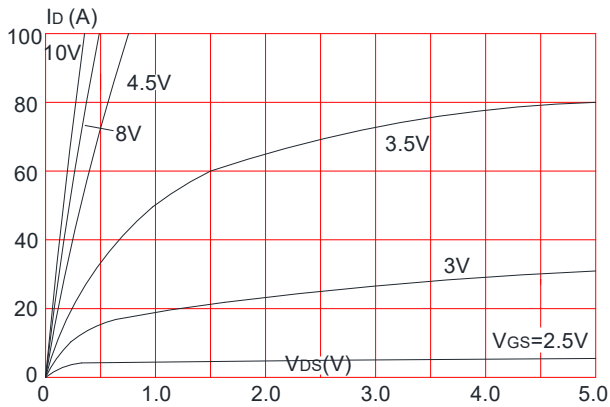


Figure 2: Typical Transfer Characteristics

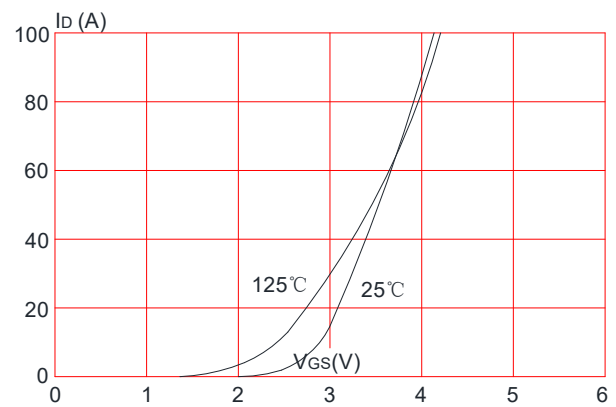


Figure 3: On-resistance vs. Drain Current

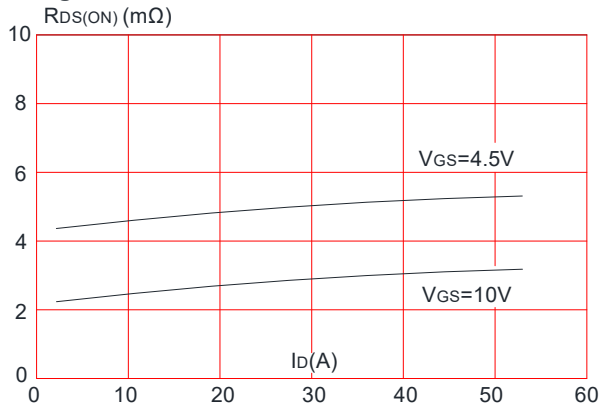


Figure 4: Body Diode Characteristics

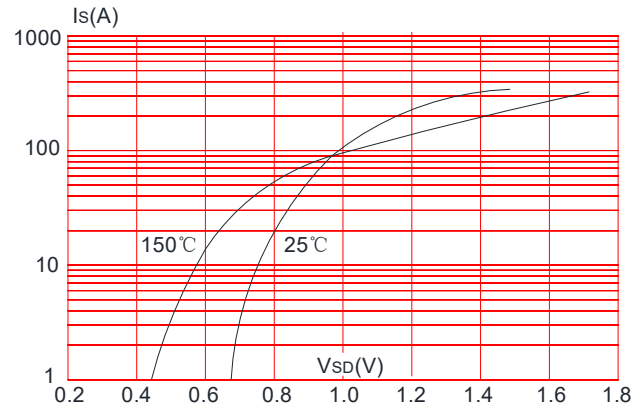


Figure 5: Gate Charge Characteristics

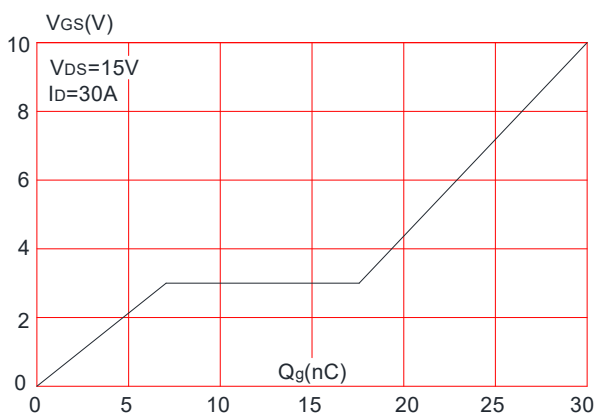


Figure 6: Capacitance Characteristics

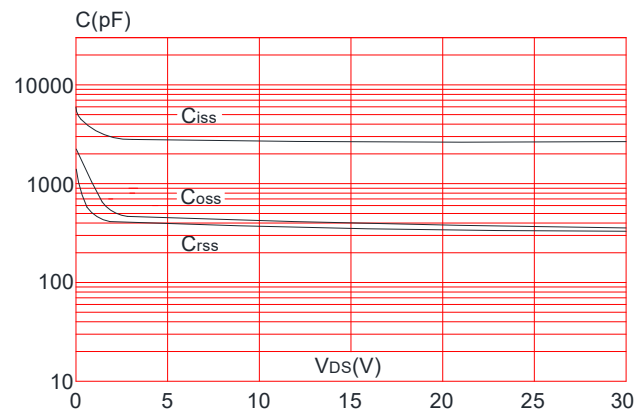


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

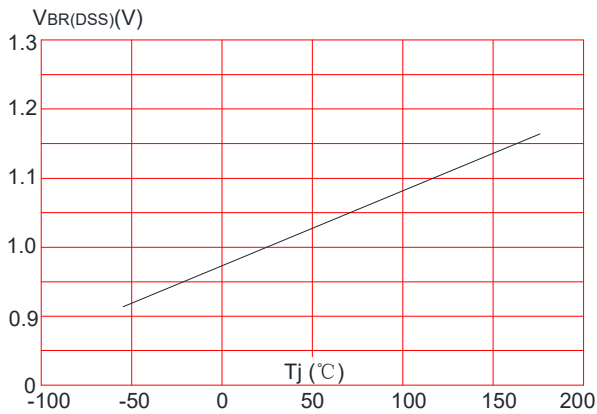


Figure 8: Normalized on Resistance vs. Junction Temperature

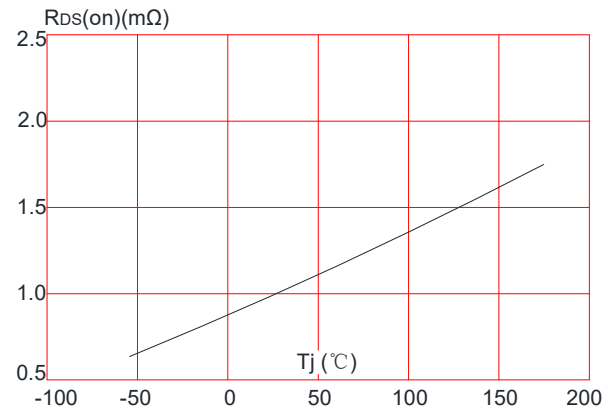


Figure 9: Maximum Safe Operating Area

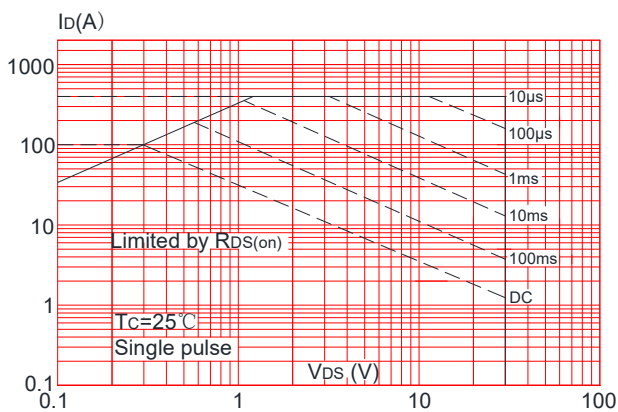


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

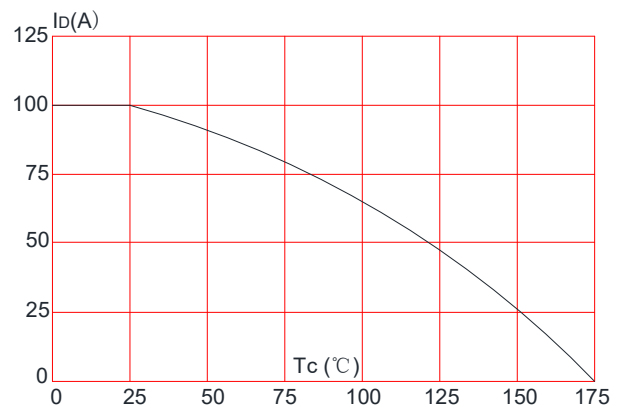
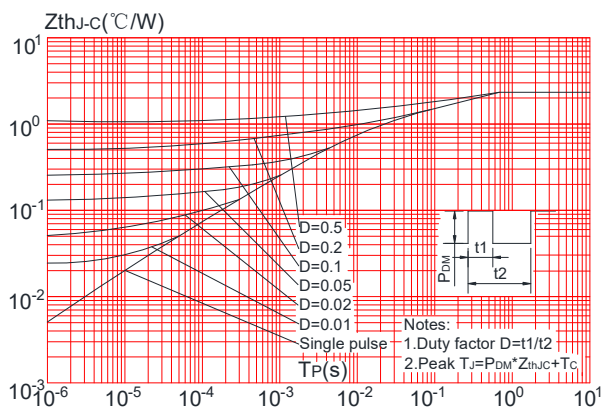
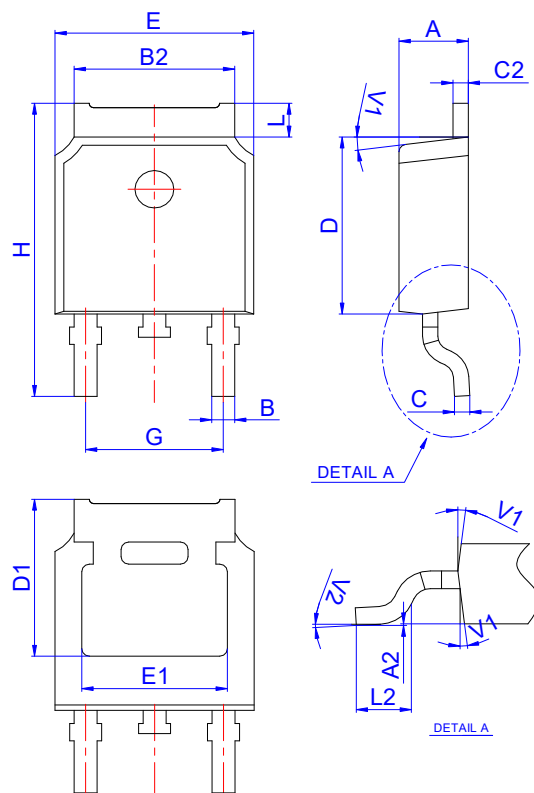


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



TO-252 PACKAGE OUTLINE DRAWING



Symbols	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°