

30V N-Channel Mosfet

FEATURES

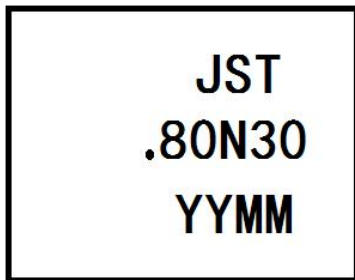
$R_{DS(ON)} \leq 5\text{m}\Omega @V_{GS}=10\text{V}$

$R_{DS(ON)} \leq 7.5\text{m}\Omega @V_{GS}=4.5\text{V}$

APPLICATIONS

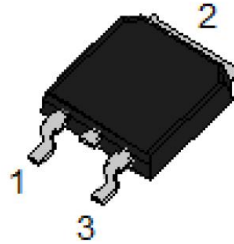
- Load Switch
- PWM Application
- Power Management

MARKING

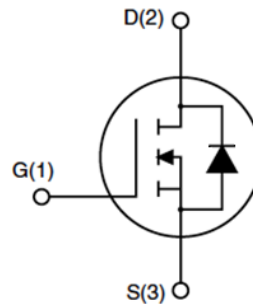


YYMM:Date Code(year&month)

TO-252-2L



N-CHANNEL MOSFET



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

Symbol	Param	Max.	Units
V_{DSS}	Drain-Source Voltage	30	V
V_{GSS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current	$T_C = 25^\circ\text{C}$	90
		$T_C = 100^\circ\text{C}$	58
I_{DM}	Pulsed Drain Current ^{note1}	360	A
E_{AS}	Single Pulsed Avalanche Energy ^{note2}	250	mJ
P_D	Power Dissipation	$T_C = 25^\circ\text{C}$	90
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.67	$^\circ\text{C}/\text{W}$
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	Param	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	1.5	2.5	V
R _{DS(on)}	Static Drain-Source on-Resistance <small>note3</small>	V _{GS} =10V, I _D =20A	-	3.6	5	mΩ
		V _{GS} =4.5V, I _D =15A	-	5	7.5	
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =15A	-	28	-	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f = 1.0MHz	-	1950	-	pF
C _{oss}	Output Capacitance		-	320	-	pF
C _{rss}	Reverse Transfer Capacitance		-	240	-	pF
Q _g	Total Gate Charge	V _{DS} =25V, I _D =20A, V _{GS} =10V	-	42	-	nC
Q _{gs}	Gate-Source Charge		-	4	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	14	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DS} =15V, R _I =0.75Ω, R _{GEN} =3Ω, V _{GS} =10V	-	13	-	ns
t _r	Turn-on Rise Time		-	36	-	ns
t _{d(off)}	Turn-off Delay Time		-	43	-	ns
t _f	Turn-off Fall Time		-	16	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	90	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	360	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 =20A, dI/dt=100A/μs	-	16	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	5	-	nC

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

2. EAS condition T_J=25°C, V_{DD}=30V, V_G=10V, L=0.5mH, R_G=25Ω

Typical Performance Characteristics

Figure 1: Output Characteristics

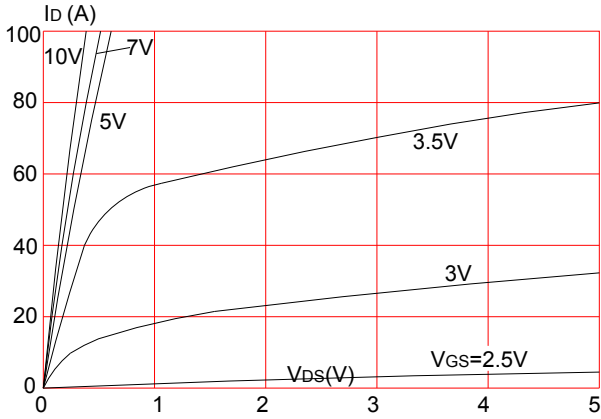


Figure 2: Typical Transfer Characteristics

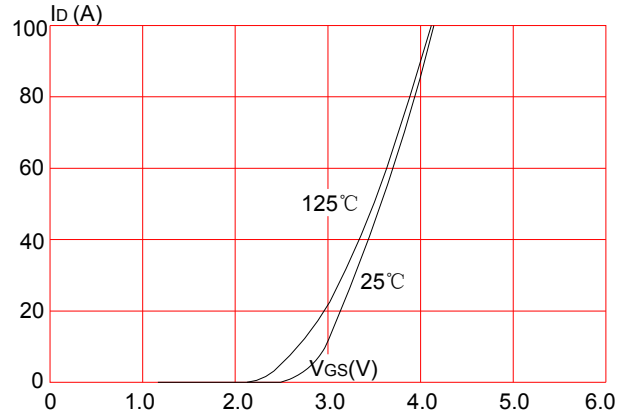


Figure 3: On-resistance vs. Drain Current

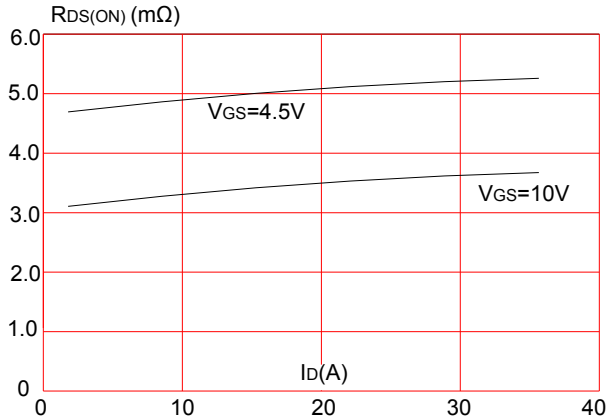


Figure 4: Body Diode Characteristics

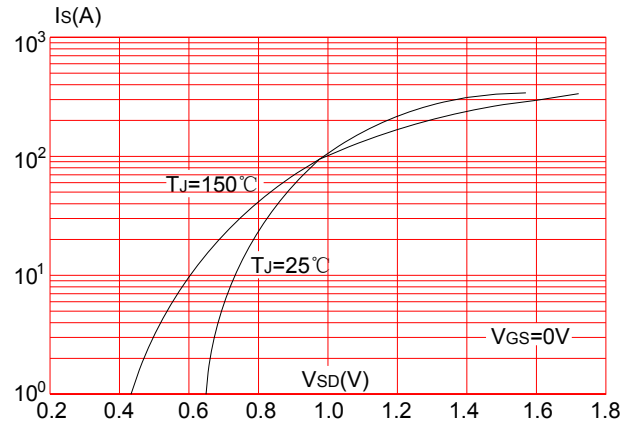


Figure 5: Gate Charge Characteristics

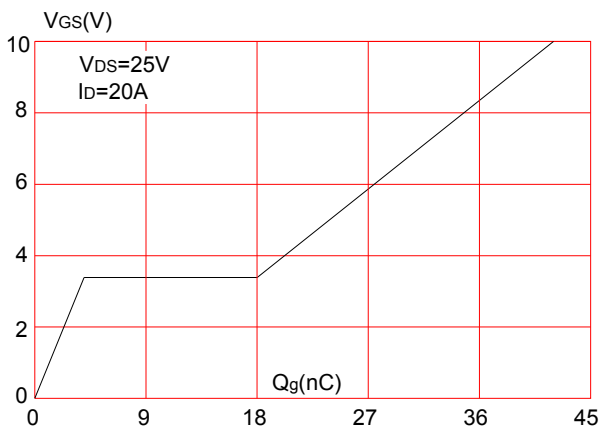


Figure 6: Capacitance Characteristics

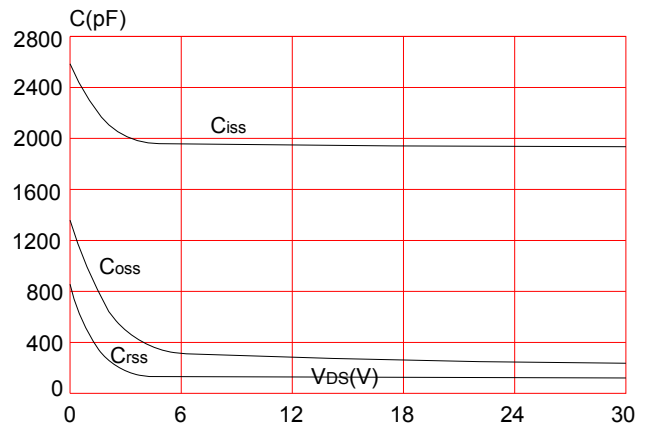


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

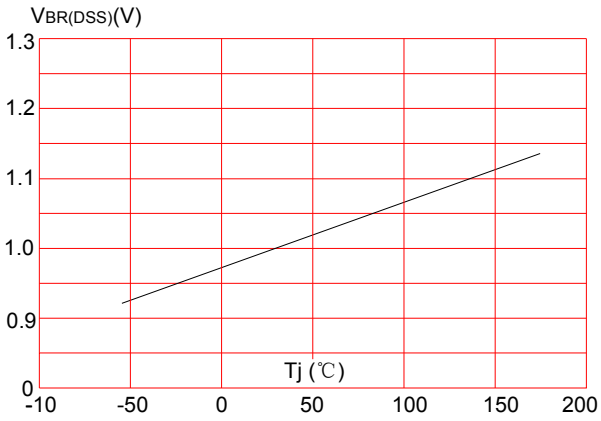


Figure 8: Normalized on Resistance vs. Junction Temperature

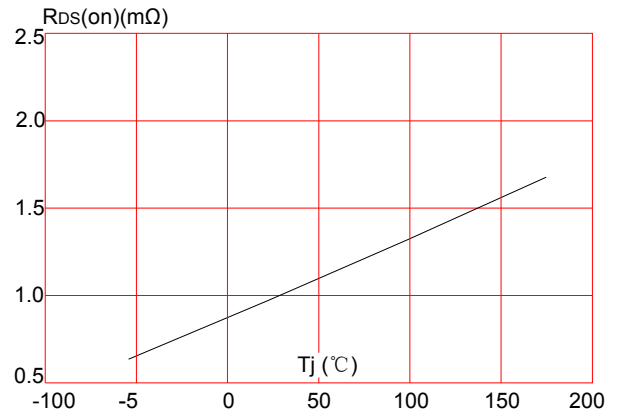


Figure 9: Maximum Safe Operating Area

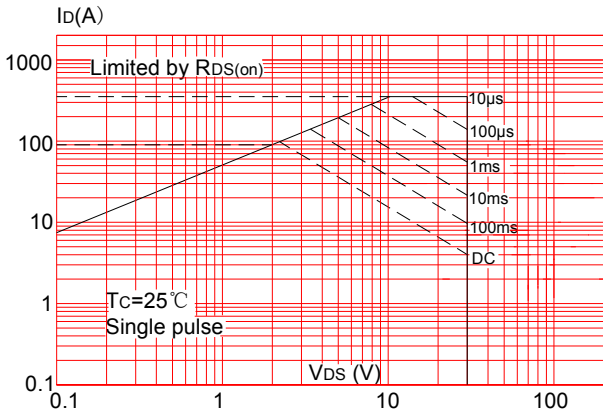


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

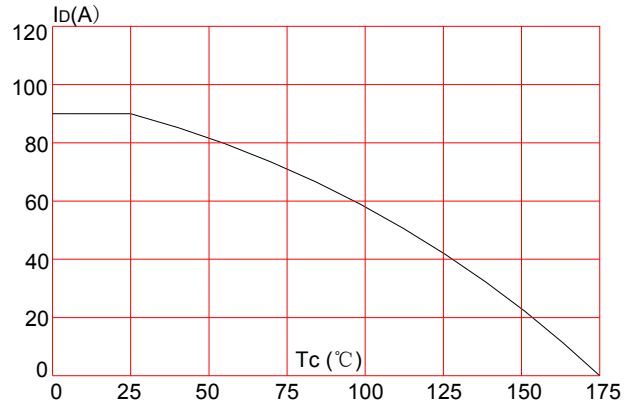
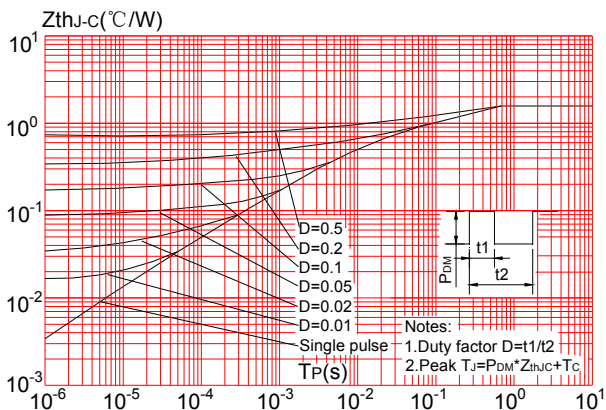
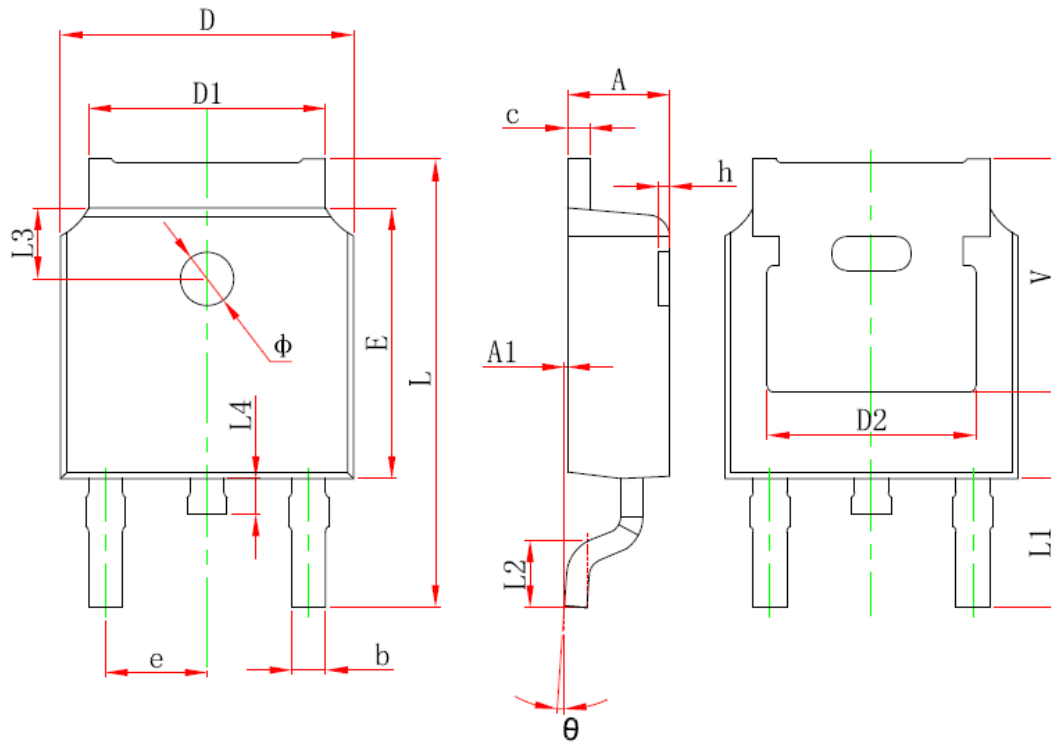


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case (TO-252)



TO-252-2L PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 REF.		0.211 REF.	