

## -30V P- Channel Mosfet

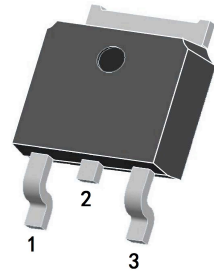
### FEATURES

- $R_{DS(ON)} < 11m\Omega$  @  $V_{GS} = -10V$
- $R_{DS(ON)} < 18m\Omega$  @  $V_{GS} = -4.5V$

### APPLICATIONS

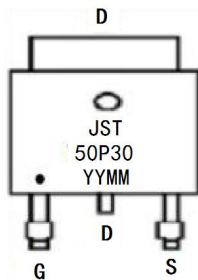
- Load Switch
- PWM Application
- Power management

### TO-252-2L



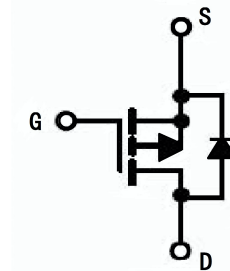
- 1: G
- 2: D
- 3: S

### MARKING



YYMM:Date Code(year&month)

### P- CHANNEL MOSFET



Maximum ratings ( $T_c=25^\circ C$  unless otherwise noted)

Symbol	Parameter	Max.	Units	
$V_{DSS}$	Drain-Source Voltage	-30	V	
$V_{GSS}$	Gate-Source Voltage	$\pm 20$	V	
$I_D$	Continuous Drain Current	$T_C = 25^\circ C$	-50	A
		$T_C = 100^\circ C$	-32.5	A
$I_{DM}$	Pulsed Drain Current <sup>note1</sup>	-200	A	
$E_{AS}$	Single Pulsed Avalanche Energy <sup>note2</sup>	78.8	mJ	
$P_D$	Power Dissipation	$T_A = 25^\circ C$	44	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.84	$^\circ C/W$	
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to +150	$^\circ C$	

**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D = -250\mu A$	-30	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = -30V, V_{GS} = 0V,$	-	-	-1	$\mu A$
$I_{GSS}$	Gate to Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.0	-1.5	-2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance <small>note3</small>	$V_{GS} = -10V, I_D = -12A$	-	8.6	11	m $\Omega$
		$V_{GS} = -4.5V, I_D = -8A$	-	13	18	
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS} = -15V, V_{GS} = 0V,$ $f = 1.0MHz$	-	2800	-	pF
$C_{oss}$	Output Capacitance		-	346	-	pF
$C_{riss}$	Reverse Transfer Capacitance		-	319	-	pF
$Q_g$	Total Gate Charge	$V_{DS} = -15V, I_D = -20A,$ $V_{GS} = -10V$	-	30	-	nC
$Q_{gs}$	Gate-Source Charge		-	5.3	-	nC
$Q_{gd}$	Gate-Drain("Miller") Charge		-	7.6	-	nC
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = -15V, I_D = -20A,$ $V_{GS} = -10V, R_{GEN} = 2.5\Omega$	-	14	-	ns
$t_r$	Turn-on Rise Time		-	20	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	95	-	ns
$t_f$	Turn-off Fall Time		-	65	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	Maximum Continuous Drain to Source Diode Forward Current		-	-	-10	A
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-40	A
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_S = -10A$	-	-0.8	-1.2	V

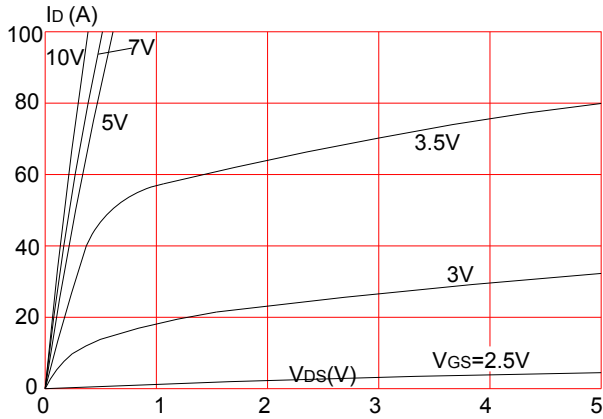
Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition:  $T_J=25^\circ\text{C}$ ,  $V_{DD}=-20V$ ,  $V_G=-10V$ ,  $L=0.5mH$ ,  $R_G=25\Omega$ ,  $I_{AS}=-17A$

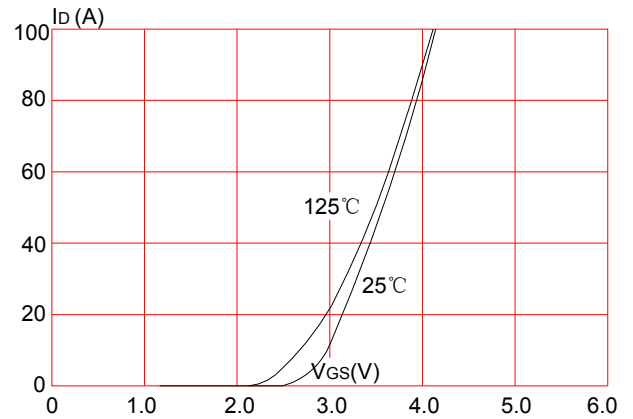
3. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 2\%$

## Typical Performance Characteristics

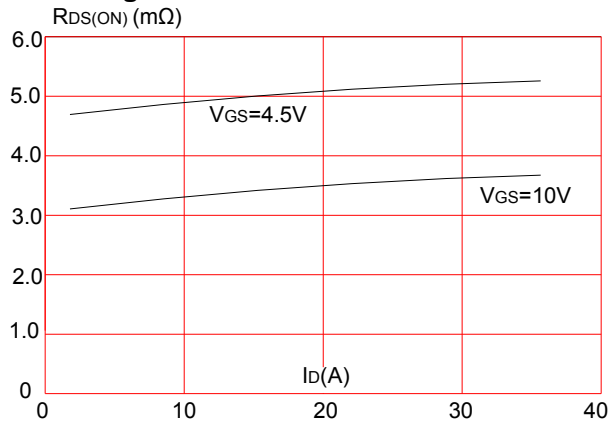
**Figure 1: Output Characteristics**



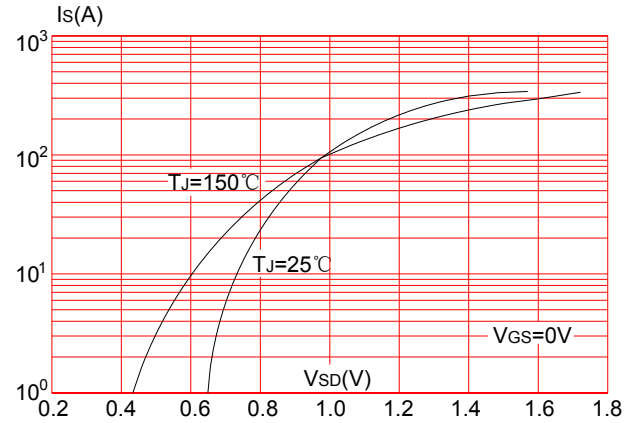
**Figure 2: Typical Transfer Characteristics**



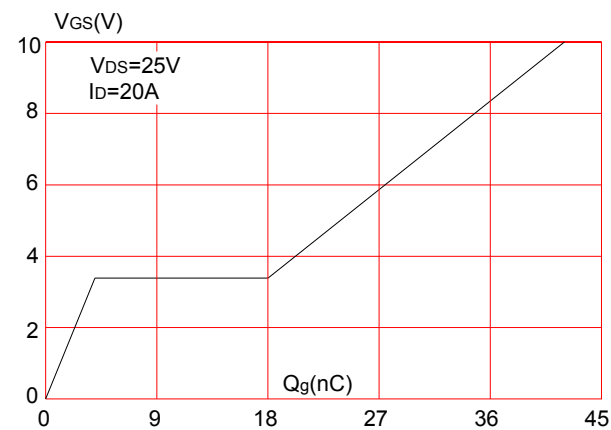
**Figure 3: On-resistance vs. Drain Current**



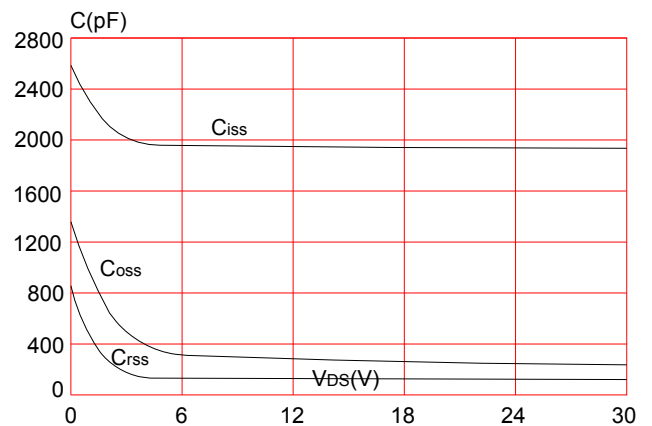
**Figure 4: Body Diode Characteristics**



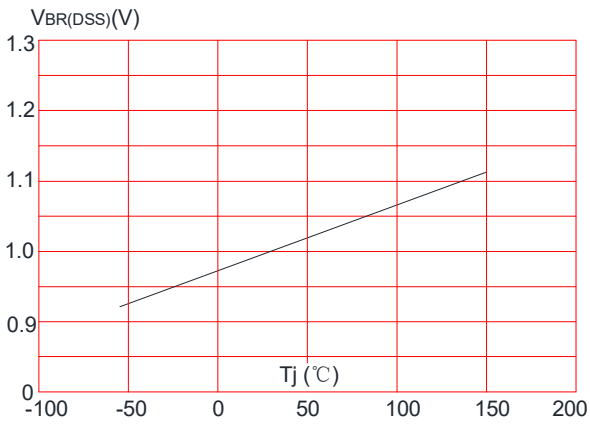
**Figure 5: Gate Charge Characteristics**



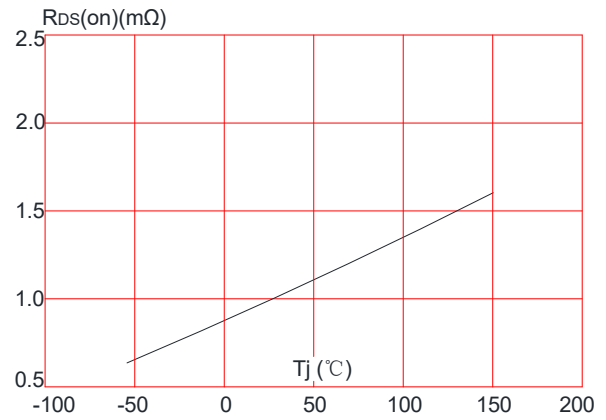
**Figure 6: Capacitance Characteristics**



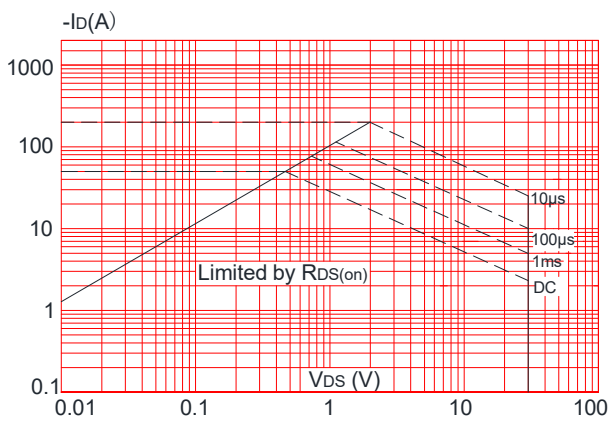
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



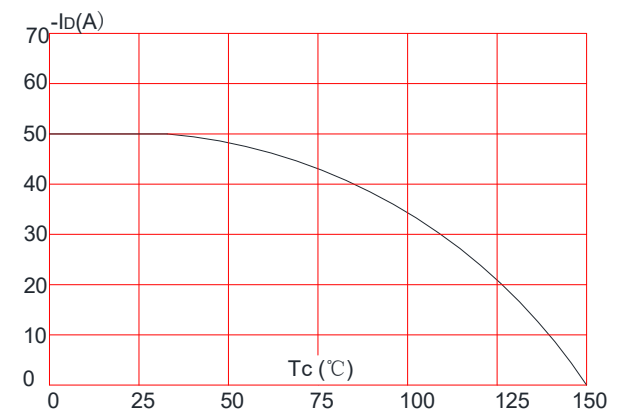
**Figure 8:** Normalized on Resistance vs. Junction Temperature



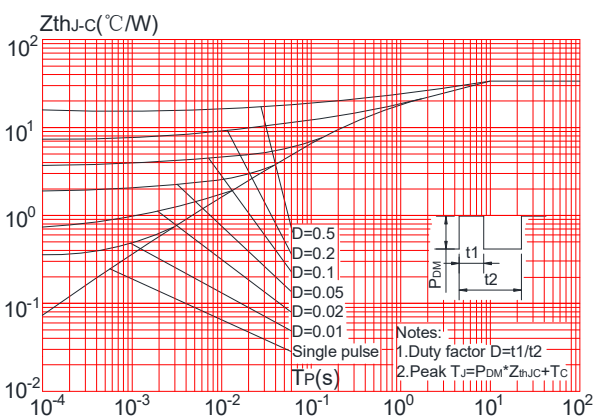
**Figure 9:** Maximum Safe Operating Area



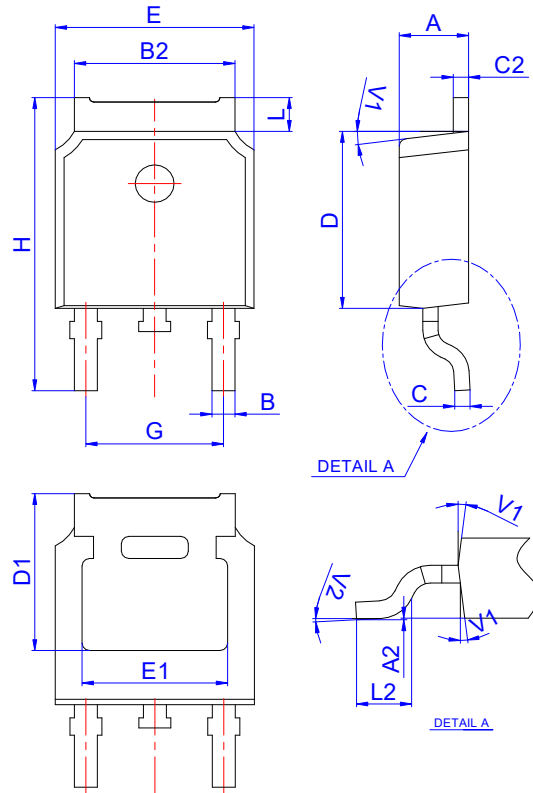
**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature



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



**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°