

**TMP6030D**

**P-Channel Enhancement Mosfet**

**General Description**

- Low  $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

**Applications**

- Load switch
- PWM

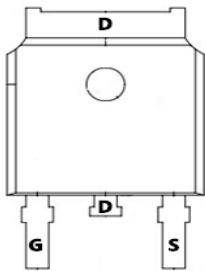
**General Features**

$V_{DS} = -60V$   $I_D = -30A$

$R_{DS(ON)} = 24m\Omega$  (typ.) @  $V_{GS} = -10V$

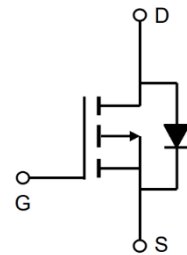
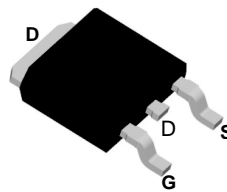
100% UIS Tested

100%  $R_g$  Tested



Marking: 30P06

D:TO-252-3L



**Absolute Maximum Ratings ( $T_A=25^\circ C$  unless otherwise noted)**

Symbol	Parameter	Limit	Unit
$V_{DS}$	Drain-Source Voltage ( $V_{GS}=0V$ )	-60	V
$V_{GS}$	Gate-Source Voltage ( $V_{DS}=0V$ )	$\pm 20$	V
$I_D$	Drain Current-Continuous( $T_C=25^\circ C$ )	-30	A
	Drain Current-Continuous( $T_C=100^\circ C$ )	-25.5	A
$I_{DM}$ (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	-144	A
$P_D$	Maximum Power Dissipation( $T_C=25^\circ C$ )	79	W
	Maximum Power Dissipation( $T_C=100^\circ C$ )	39.5	W
$E_{AS}$	Avalanche energy (Note 2)	196	mJ
$T_J, T_{STG}$	Operating Junction and Storage Temperature Range	-55 To 175	$^\circ C$

**Thermal Characteristic**

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case		1.9	$^\circ C/W$

Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>On/Off States</b>						
B <sub>V</sub> DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V I <sub>D</sub> =-250μA	-60			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-60V, V <sub>GS</sub> =0V			-1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V			±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-1	-1.6	-2.5	V
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-15A		35		S
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =-10V, I <sub>D</sub> =-15A		24	29	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-10A		30	39	mΩ
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-25V, V <sub>GS</sub> =0V, f=1.0MHz		4026		pF
C <sub>oss</sub>	Output Capacitance			134		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			98		pF
<b>Switching Parameters</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-30V, R <sub>L</sub> =1.5Ω, R <sub>GEN</sub> =3Ω		12.2		nS
t <sub>r</sub>	Turn-on Rise Time			10		nS
t <sub>d(off)</sub>	Turn-Off Delay Time			64		nS
t <sub>f</sub>	Turn-Off Fall Time			14		nS
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-30V, I <sub>D</sub> =-20A		68		nC
Q <sub>gs</sub>	Gate-Source Charge			10.5		nC
Q <sub>gd</sub>	Gate-Drain Charge			13		nC
<b>Source-Drain Diode Characteristics</b>						
I <sub>SD</sub>	Source-Drain Current (Body Diode)				-30	A
V <sub>SD</sub>	Forward on Voltage (Note 3)	V <sub>GS</sub> =0V, I <sub>S</sub> =-15A			-1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> =-20A, di/dt=100A/μs		26		ns
Q <sub>rr</sub>	Reverse Recovery Charge	I <sub>F</sub> =-20A, di/dt=100A/μs		29		nC

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

Notes 2.E<sub>AS</sub> Condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=40V, V<sub>G</sub>=-10V, R<sub>g</sub>=25Ω, L=0.5mH.

Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

Typical Electrical And Thermal Characteristics (Curves)

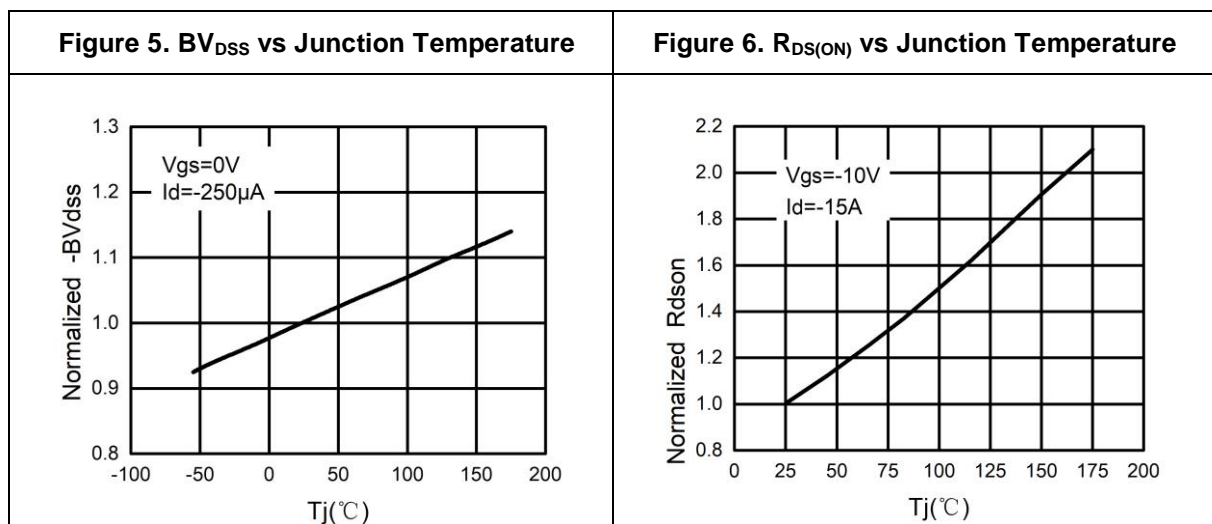
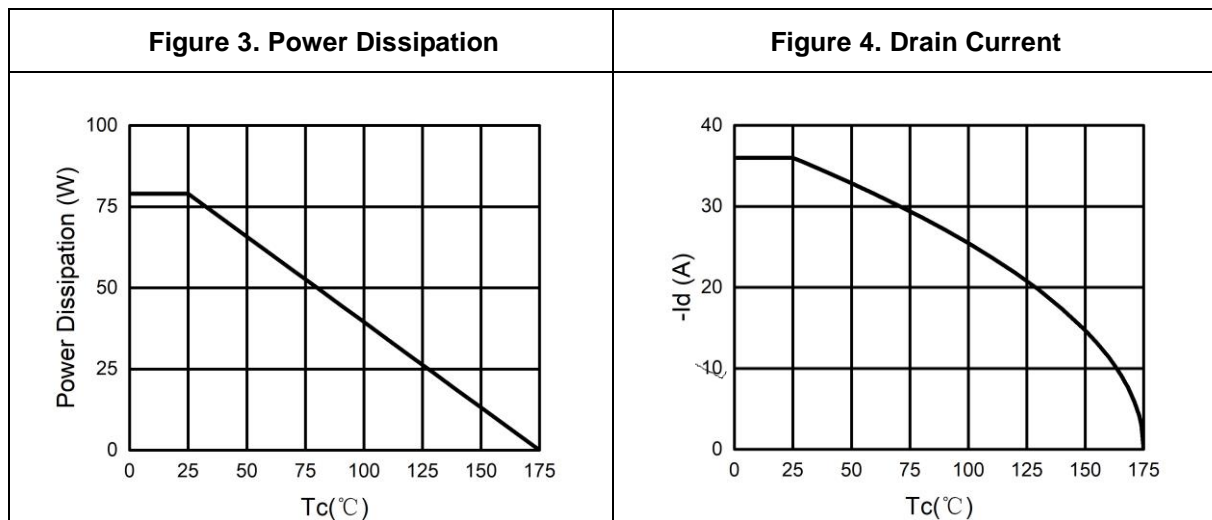
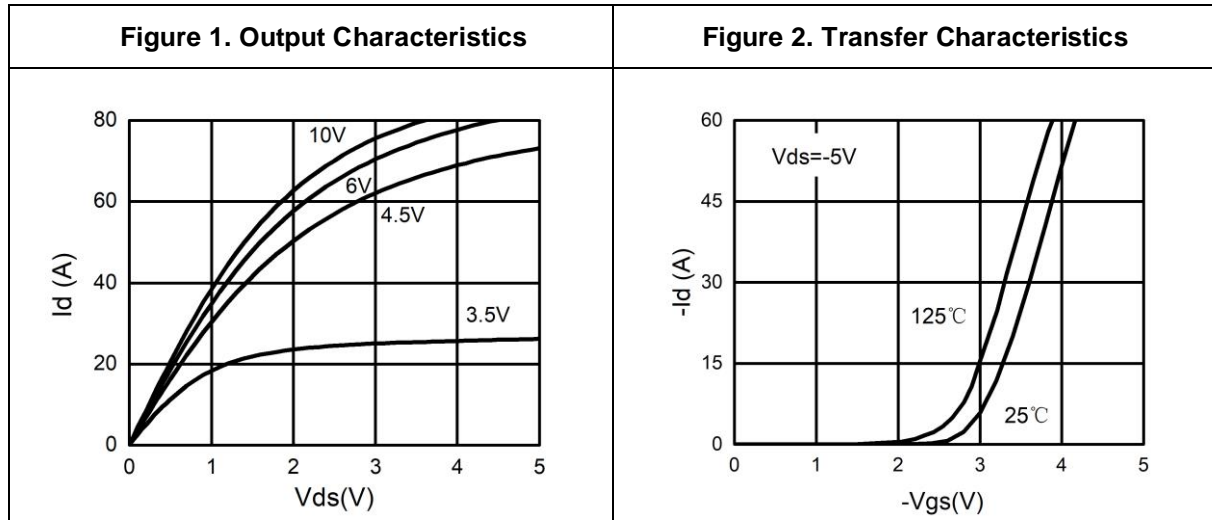


Figure 7. Gate Charge Waveforms

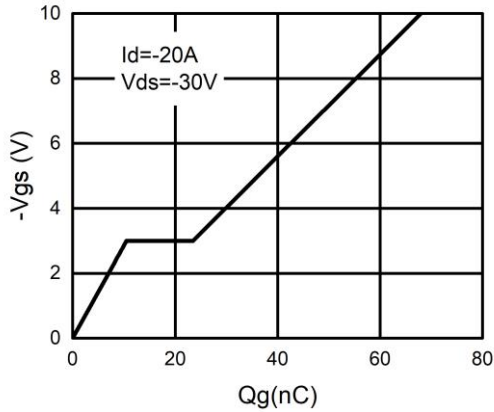


Figure 8. Capacitance

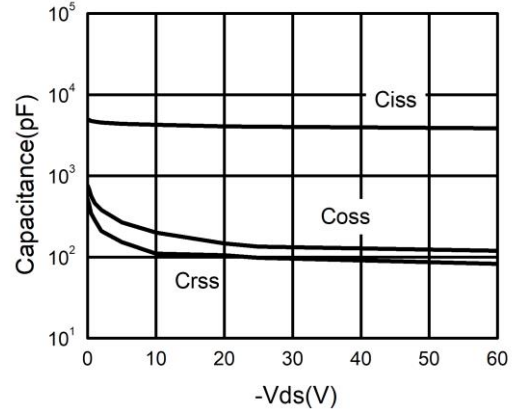


Figure 9. Body-Diode Characteristics

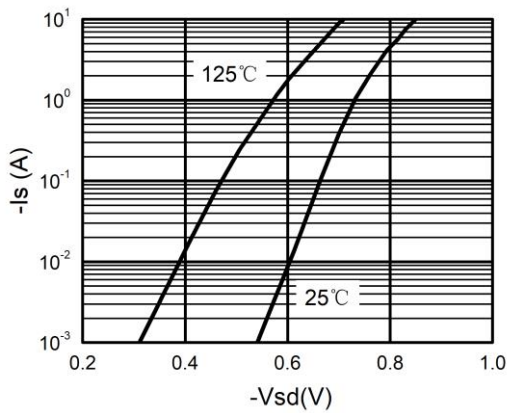
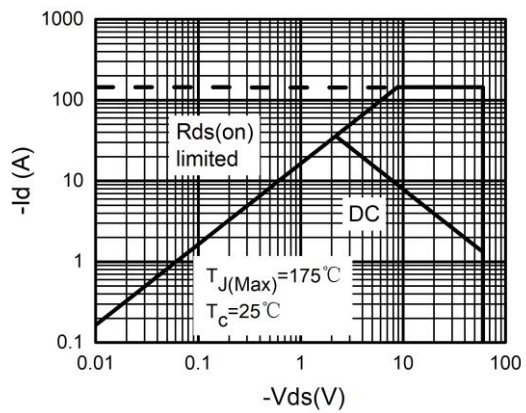
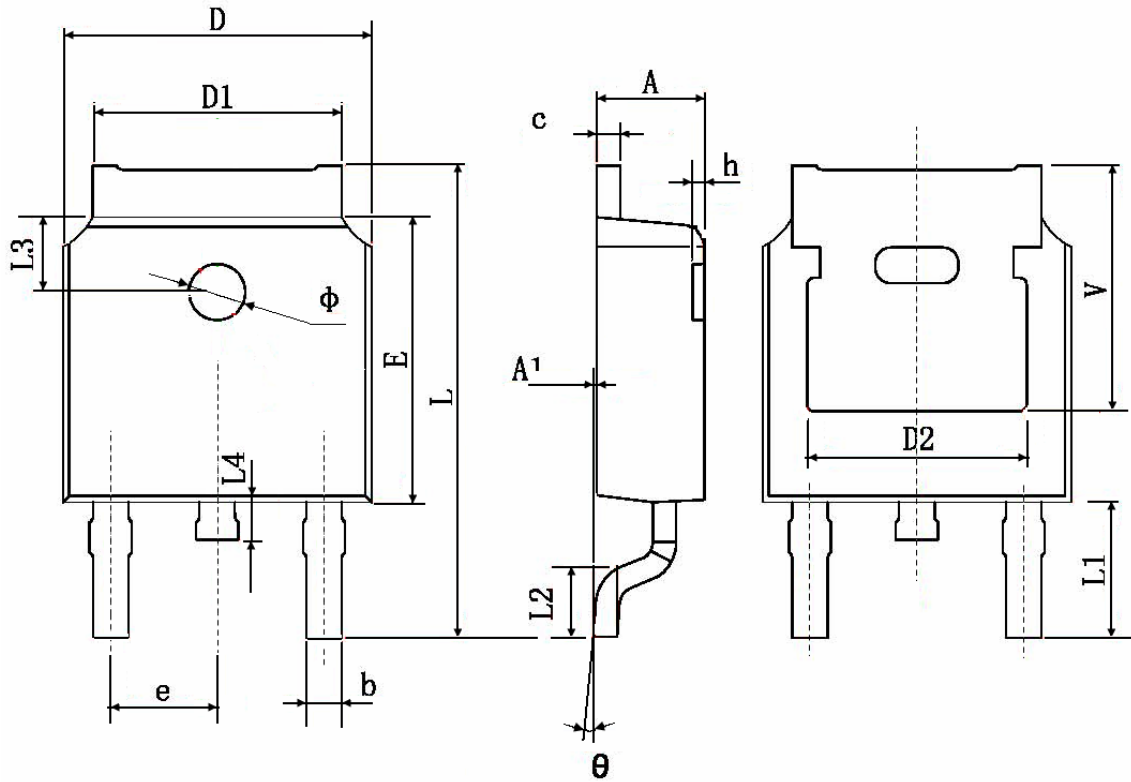


Figure 10. Maximum Safe Operating Area



# Package Information:TO-252-3L



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 TYP.		0.190 TYP.	
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 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
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 TYP.		0.211 TYP.	

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