



Description

The HSPD30P06PG uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

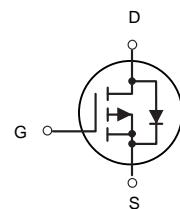


TO-252-2L

General Features

$V_{DS} = -60V$ $I_D = -15A$

$R_{DS(ON)} < 82m\Omega$ @ $V_{GS}=10V$



Battery protection

P-Channel MOSFET

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
HSPD30P06PG	TO-252-2L	HXY MOSFET	2500

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_c=25^\circ C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-15	A
$I_D @ T_c=100^\circ C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-11	A
I_{DM}	Pulsed Drain Current ²	-36	A
EAS	Single Pulse Avalanche Energy ³	35.4	mJ
I_{AS}	Avalanche Current	-26.6	A
$P_D @ T_c=25^\circ C$	Total Power Dissipation ⁴	34.7	W
$P_D @ T_A=25^\circ C$	Total Power Dissipation ⁴	2	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	3.6	°C/W



Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$\text{V}_{\text{GS}}=0\text{V}$, $\text{I}_D=-250\text{uA}$	-60	---	---	V
$\Delta \text{BV}_{\text{DSS}} / \Delta T_j$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $\text{I}_D=-1\text{mA}$	---	-0.03	---	$\text{V}/^\circ\text{C}$
$\text{R}_{\text{DS}(\text{ON})}$	Static Drain-Source On-Resistance	$\text{V}_{\text{GS}}=-10\text{V}$, $\text{I}_D=-12\text{A}$	---	70	82	$\text{m}\Omega$
		$\text{V}_{\text{GS}}=-4.5\text{V}$, $\text{I}_D=-8\text{A}$	---	85	105	
$\text{V}_{\text{GS}(\text{th})}$	Gate Threshold Voltage	$\text{V}_{\text{GS}}=\text{V}_{\text{DS}}$, $\text{I}_D=-250\text{uA}$	-1.2	1.5	-2.5	V
$\Delta \text{V}_{\text{GS}(\text{th})}$	$\text{V}_{\text{GS}(\text{th})}$ Temperature Coefficient		---	4.56	---	$\text{mV}/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$\text{V}_{\text{DS}}=-48\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$, $T_j=25^\circ\text{C}$	---	---	1	uA
		$\text{V}_{\text{DS}}=-48\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$, $T_j=55^\circ\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$\text{V}_{\text{GS}}=\pm 20\text{V}$, $\text{V}_{\text{DS}}=0\text{V}$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$\text{V}_{\text{DS}}=-5\text{V}$, $\text{I}_D=-12\text{A}$	---	15.4	---	S
R_g	Gate Resistance	$\text{V}_{\text{DS}}=0\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$, $f=1\text{MHz}$	---	13.5	---	Ω
Q_g	Total Gate Charge (-4.5V)	$\text{V}_{\text{DS}}=-48\text{V}$, $\text{V}_{\text{GS}}=-4.5\text{V}$, $\text{I}_D=-10\text{A}$	---	9.86	---	nC
Q_{gs}	Gate-Source Charge		---	3.08	---	
Q_{gd}	Gate-Drain Charge		---	2.95	---	
$\text{T}_{\text{d}(\text{on})}$	Turn-On Delay Time	$\text{V}_{\text{DD}}=-15\text{V}$, $\text{V}_{\text{GS}}=-10\text{V}$, $\text{R}_g=3.3\Omega$, $\text{I}_D=-1\text{A}$	---	28.8	---	ns
T_r	Rise Time		---	19.8	---	
$\text{T}_{\text{d}(\text{off})}$	Turn-Off Delay Time		---	60.8	---	
T_f	Fall Time		---	7.2	---	
C_{iss}	Input Capacitance	$\text{V}_{\text{DS}}=-15\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$, $f=1\text{MHz}$	---	1447	---	pF
C_{oss}	Output Capacitance		---	97.3	---	
C_{rss}	Reverse Transfer Capacitance		---	70	---	
I_{s}	Continuous Source Current ^{1,5}	$\text{V}_{\text{G}}=\text{V}_{\text{D}}=0\text{V}$, Force Current	---	---	-18	A
I_{SM}	Pulsed Source Current ^{2,5}		---	---	-36	A
V_{SD}	Diode Forward Voltage ²	$\text{V}_{\text{GS}}=0\text{V}$, $\text{I}_s=-1\text{A}$, $T_j=25^\circ\text{C}$	---	---	-1.2	V

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width $\leq 300\text{us}$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $\text{V}_{\text{DD}}=-25\text{V}$, $\text{V}_{\text{GS}}=-10\text{V}$, $\text{L}=0.1\text{mH}$, $\text{I}_{\text{AS}}=-26.6\text{A}$
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.



Typical Characteristics

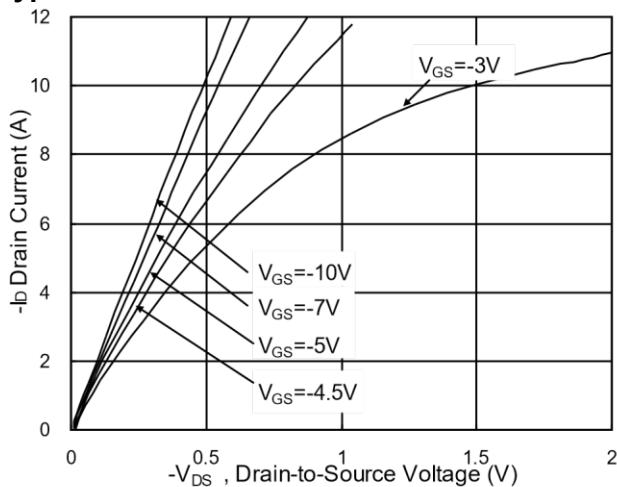


Fig.1 Typical Output Characteristics

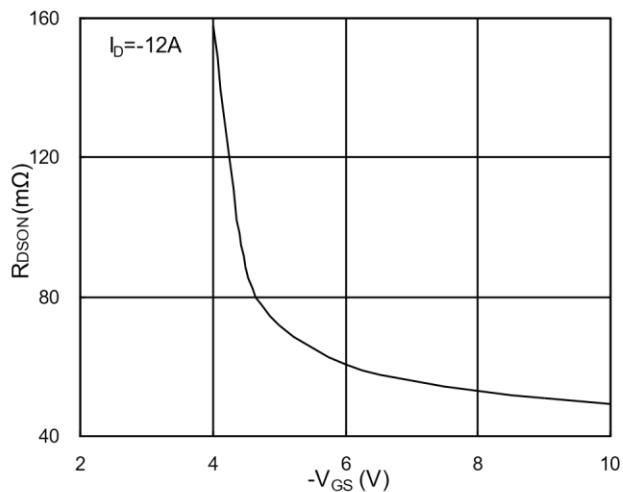


Fig.2 On-Resistance v.s Gate-Source

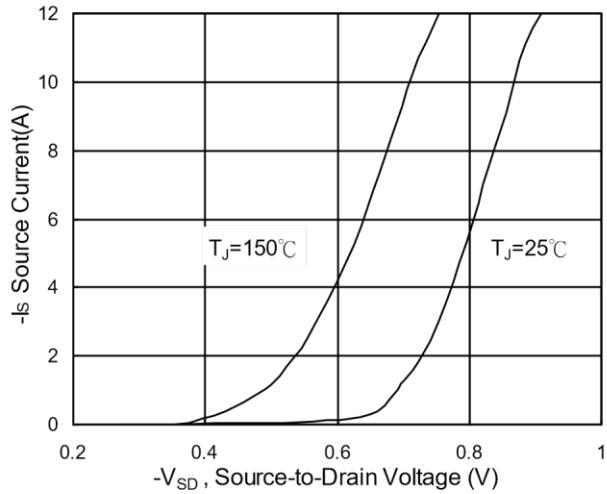


Fig.3 Forward Characteristics of Reverse

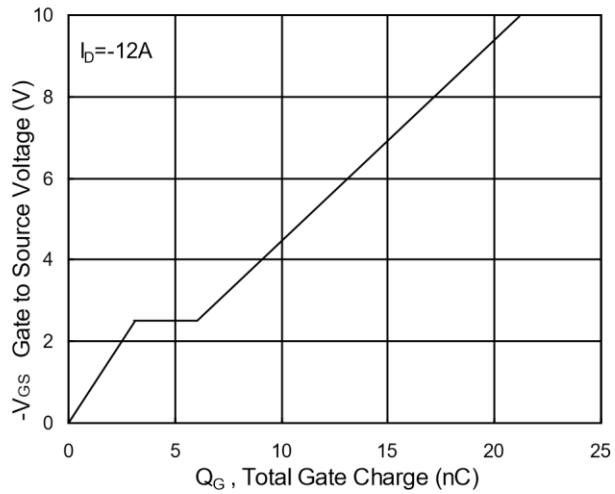


Fig.4 Gate-Charge Characteristics

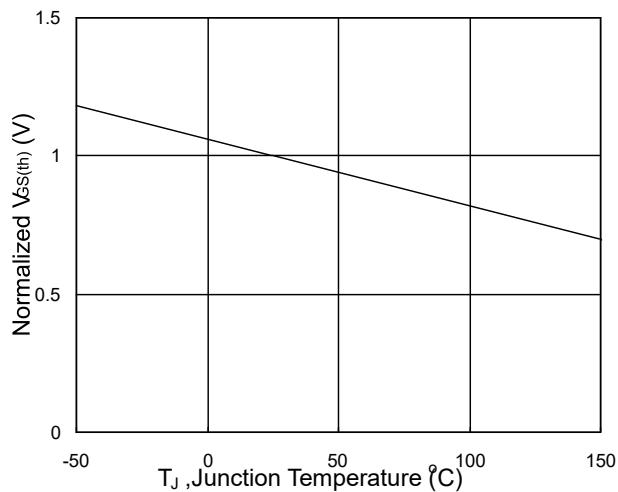


Fig.5 Normalized VGS(th) v.s TJ

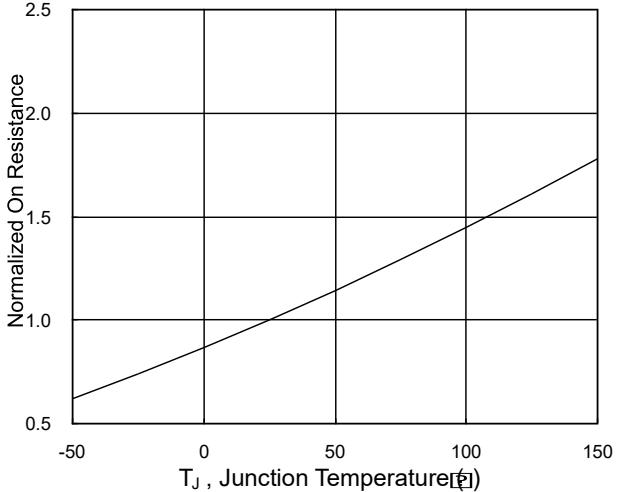
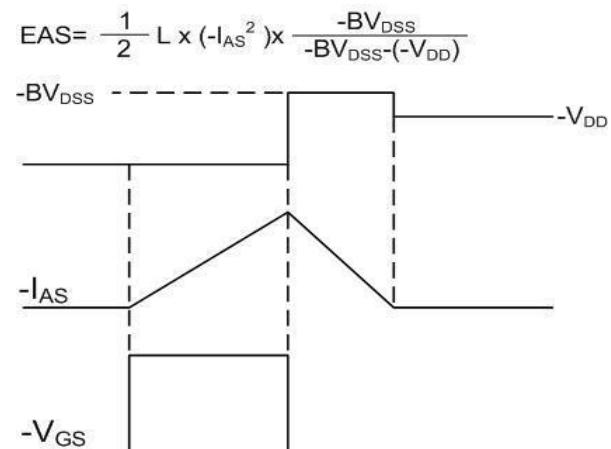
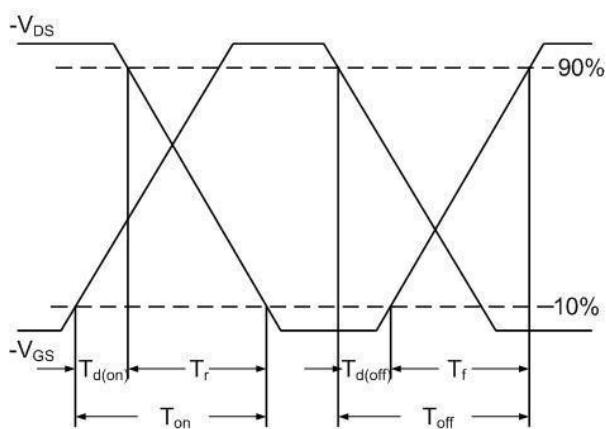
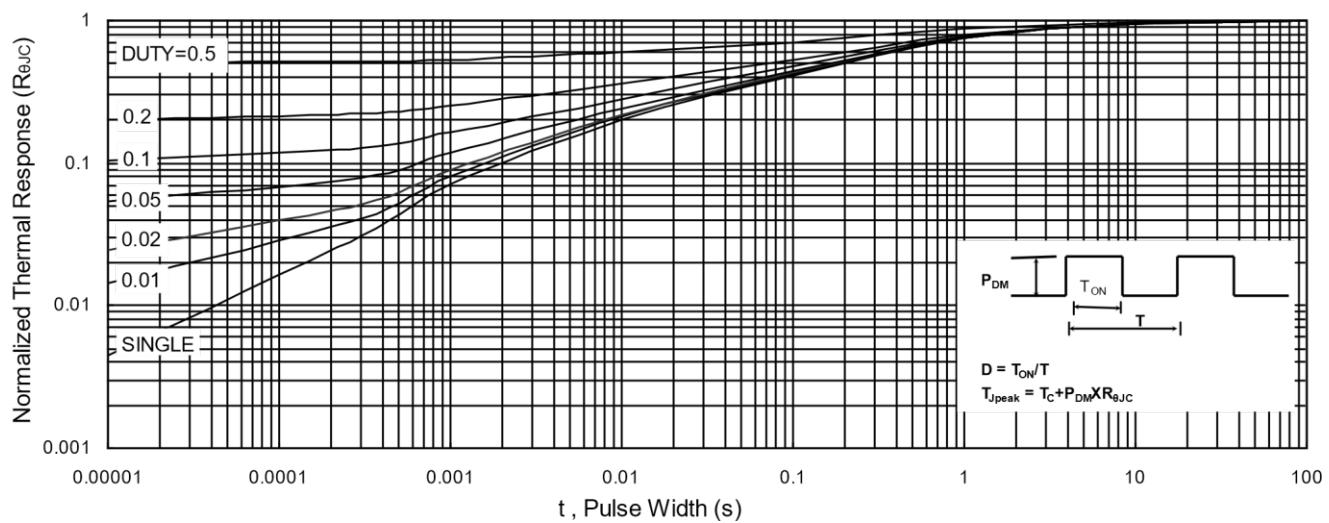
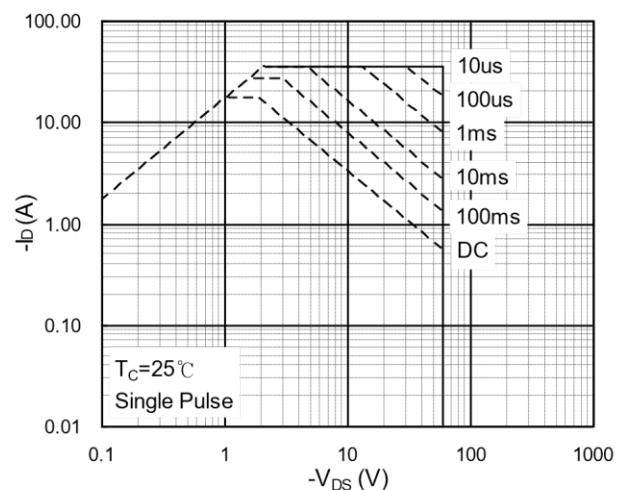
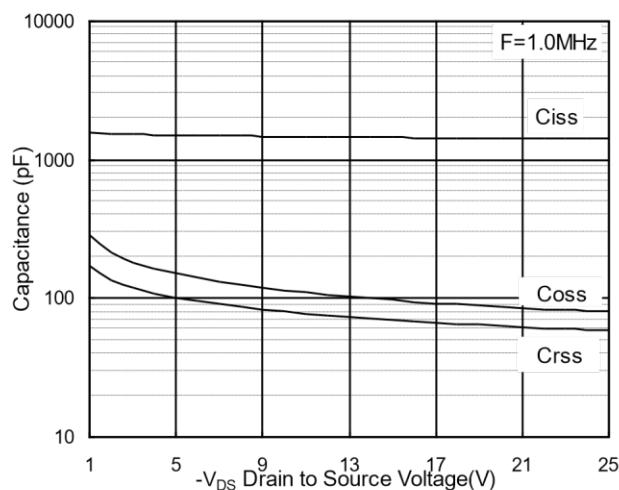
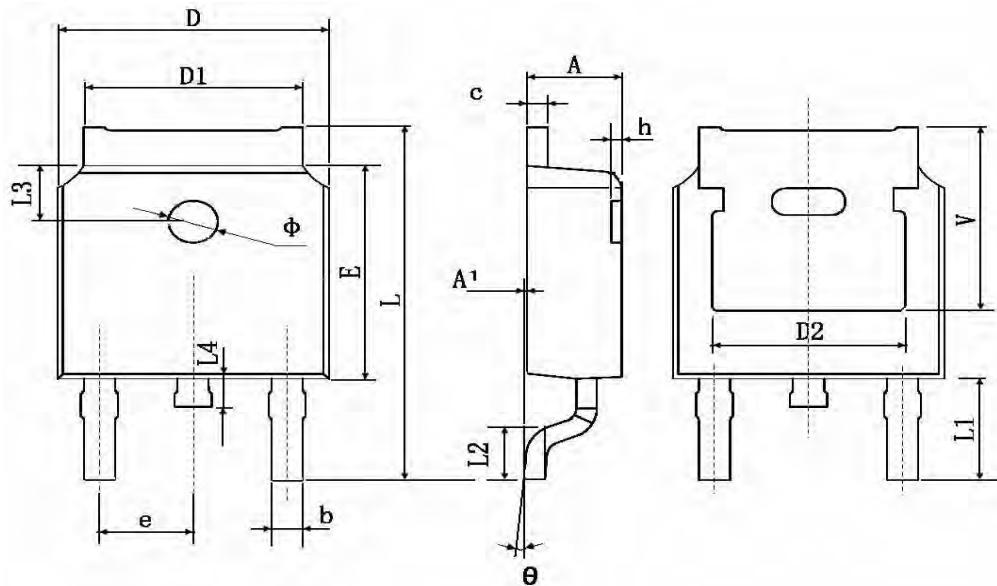


Fig.6 Normalized RDS(on) v.s TJ





TO-252-2L Package Information



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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