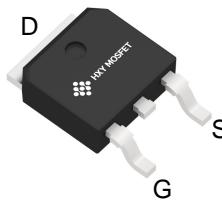




Description

The HXY60P03D 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.

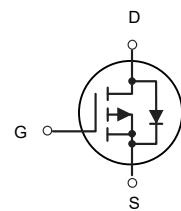


TO-252-2L

General Features

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

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



P-Channel MOSFET

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
HXY60P03D	TO-252-2L	60P03 XXX YYYY	2500

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 25	V
$I_D @ T_c=25^\circ C$	Continuous Drain Current, $V_{GS} @ -10V$	-60	A
$I_D @ T_c=100^\circ C$	Continuous Drain Current, $V_{GS} @ -10V$	-30	A
I_{DM}	Pulsed Drain Current	-150	A
EAS	Single Pulse Avalanche Energy	125	mJ
I_{AS}	Avalanche Current	-50	A
$P_D @ T_c=25^\circ C$	Total Power Dissipation	45	W
$P_D @ T_A=25^\circ C$	Total Power Dissipation	2.0	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	62	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ($t \leq 10s$)	25	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	2.8	°C/W



Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-30	---	---	V
△BV _{DSS} /△T _J	BVDSS Temperature Coefficient	Reference to 25°C, I _D =-1mA	---	-0.0232	---	V/°C
R _{DSON}	Static Drain-Source On-Resistance ²	V _{GS} =-10V, I _D =-30A	---	7	10	mΩ
		V _{GS} =-4.5V, I _D =-15A	---	13	18	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-1.0	---	-2.5	V
△V _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	4.6	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-24V, V _{GS} =0V, T _J =25°C	---	---	-1	uA
		V _{DS} =-24V, V _{GS} =0V, T _J =55°C	---	---	-5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±25V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =-5V, I _D =-30A	---	30	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	9	---	Ω
Q _g	Total Gate Charge (-4.5V)	V _{DS} =-15V, V _{GS} =-4.5V, I _D =-15A	---	22	---	nC
Q _{gs}	Gate-Source Charge		---	8.7	---	
Q _{gd}	Gate-Drain Charge		---	7.2	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =-15V, V _{GS} =-10V, R _G =3.3 I _D =-15A	---	8	---	ns
T _r	Rise Time		---	73.7	---	
T _{d(off)}	Turn-Off Delay Time		---	61.8	---	
T _f	Fall Time		---	24.4	---	
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	---	2215	---	pF
C _{oss}	Output Capacitance		---	310	---	
C _{rss}	Reverse Transfer Capacitance		---	237	---	
I _s	Continuous Source Current ^{1,5}	V _G =V _D =0V, Force Current	---	---	-45	A
I _{SM}	Pulsed Source Current ^{2,5}		---	---	-150	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _s =-1A, T _J =25°C	---	---	-1	V
t _{rr}	Reverse Recovery Time	I _F =-15A, dI/dt=100A/μs, T _J =25°C	---	19	---	nS
Q _{rr}	Reverse Recovery Charge	T _J =25°C	---	9	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch²FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The EAS data shows Max. rating . The test condition is V_{DD}=-25V,V_{GS}=-10V,L=0.1mH,I_{AS}=-50A
- 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

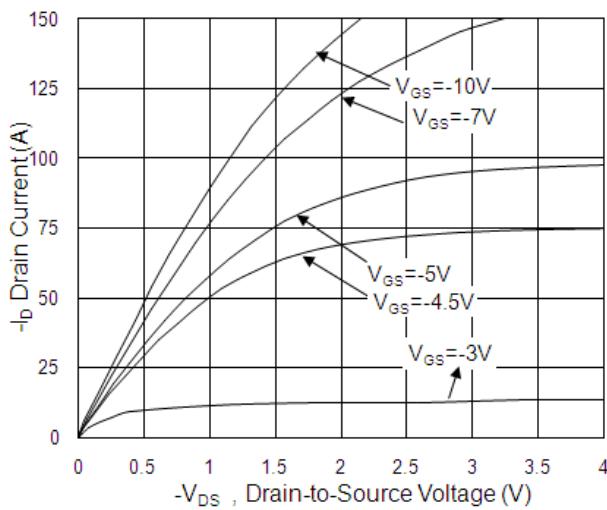


Fig.1 Typical Output Characteristics

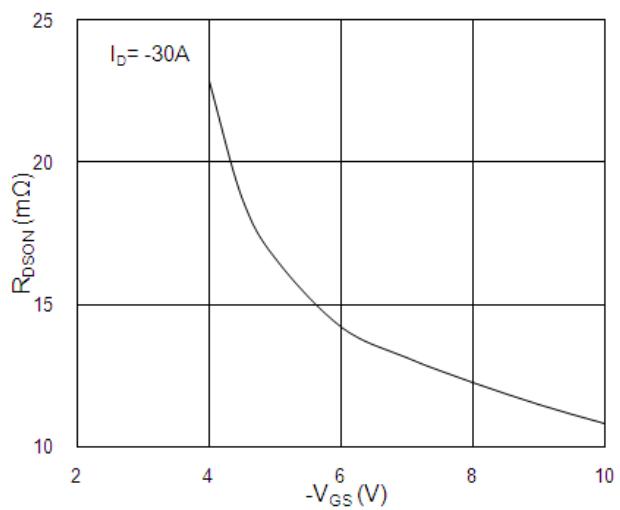


Fig.2 On-Resistance vs. G-S Voltage

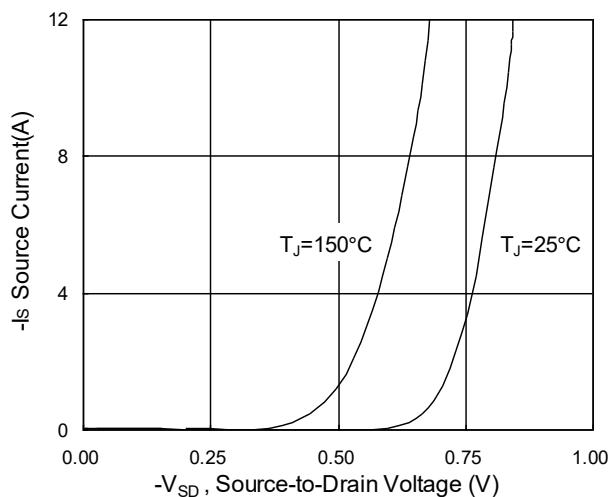


Fig.3 Forward Characteristics of Reverse

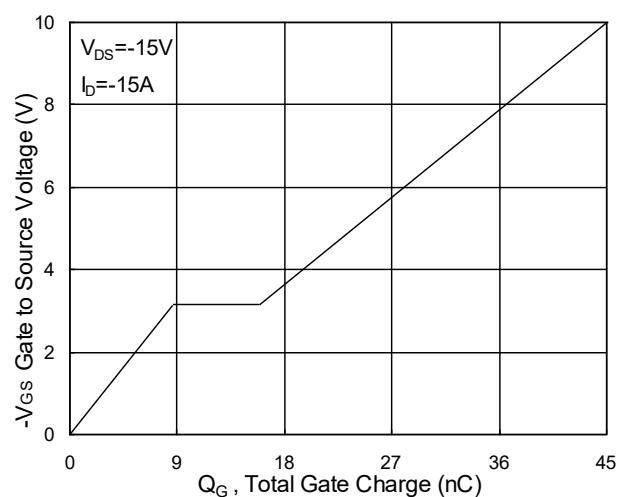


Fig.4 Gate-charge Characteristics

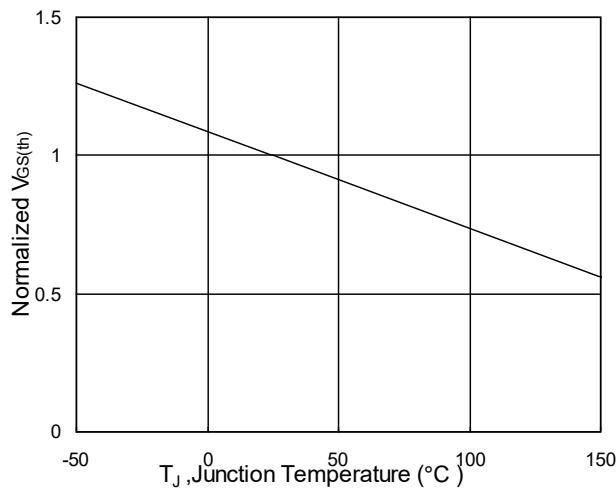


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

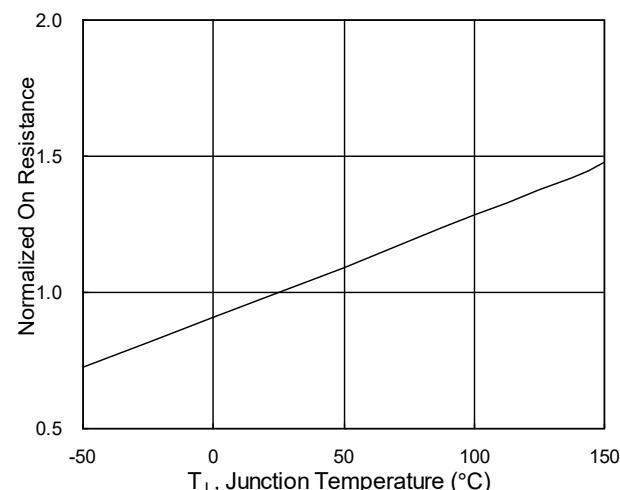


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

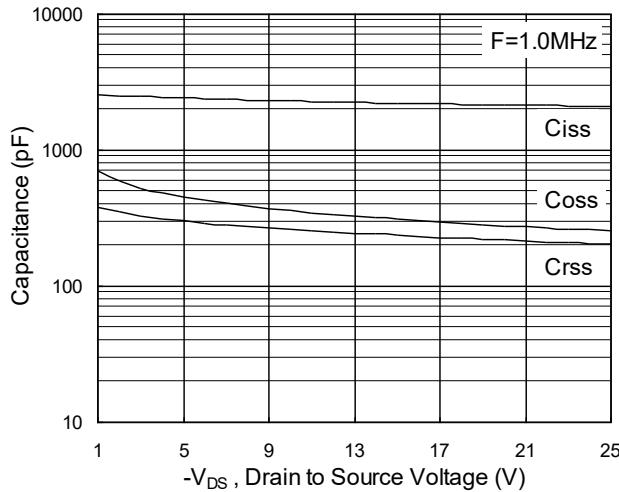


Fig.7 Capacitance

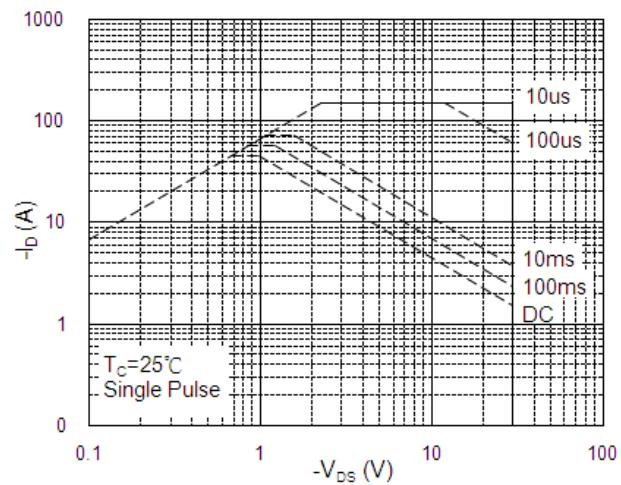


Fig.8 Safe Operating Area

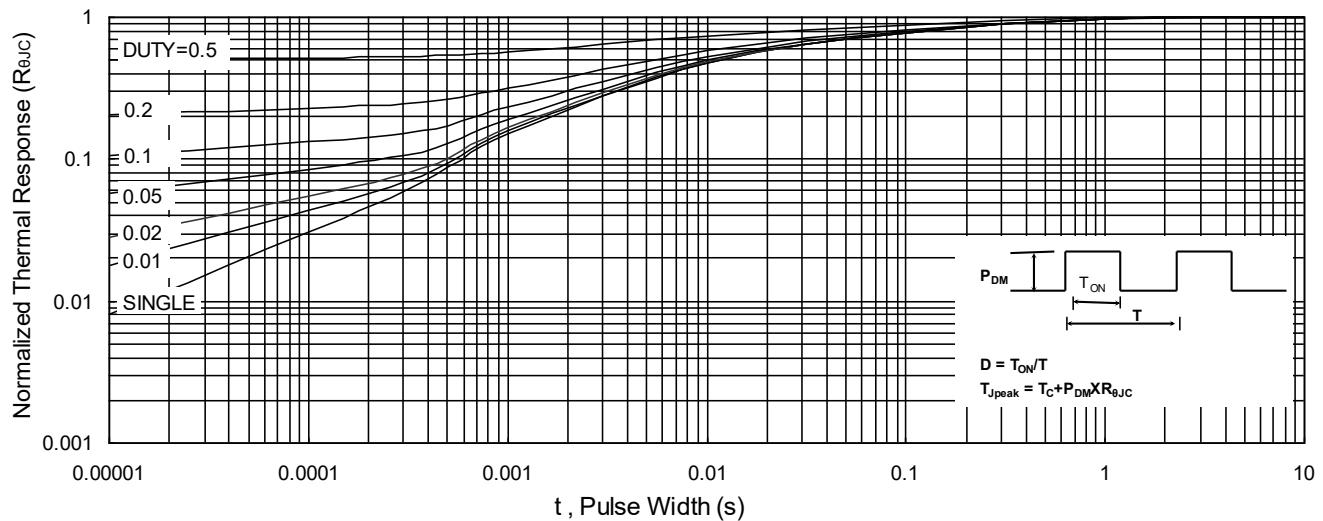


Fig.9 Normalized Maximum Transient Thermal Impedance

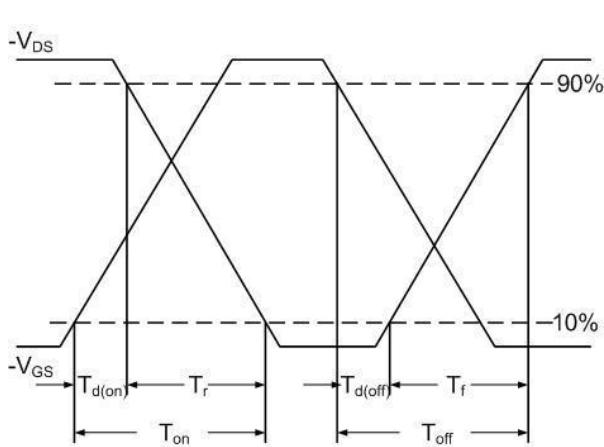


Fig.10 Switching Time Waveform

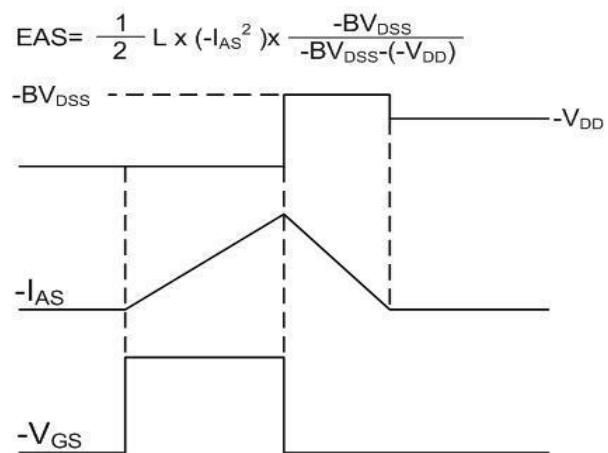
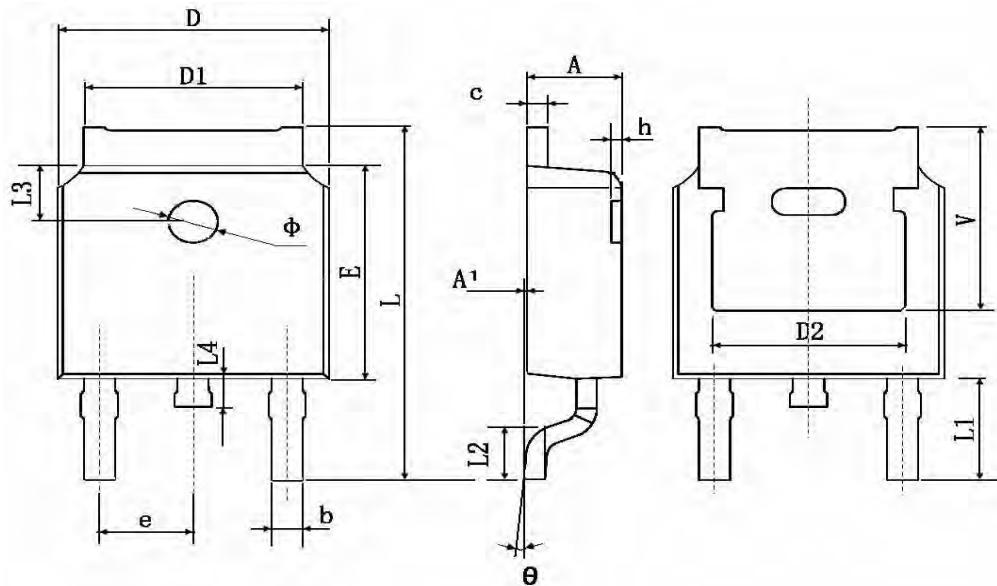


Fig.11 Unclamped Inductive Switching Waveform



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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