



Description

The HXY10P10D 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.

General Features

$V_{DS} = -100V$ $I_D = -10A$

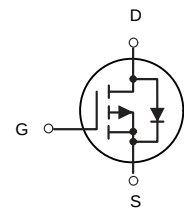
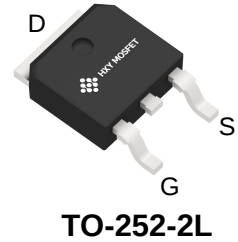
$R_{DS(ON)} < 220\text{ m}\Omega$ @ $V_{GS}=10V$

Application

Battery protection

Load switch

Uninterruptible power supply



P-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
HXY10P10D	TO-252-2L	10P10 XXX YYYY	2500

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	± 25	V
$I_D@T_C=25^{\circ}\text{C}$	Continuous Drain Current, V_{GS} @ 10V	-10	A
$I_D@T_C=100^{\circ}\text{C}$	Continuous Drain Current, V_{GS} @ 10V	-4	A
I_{DM}	Pulsed Drain Current	-20	A
$P_D@T_C=25^{\circ}\text{C}$	Total Power Dissipation	10	W
TSTG	Storage Temperature Range	-55 to 150	$^{\circ}\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction-ambient	72	$^{\circ}\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case	8	$^{\circ}\text{C/W}$



P-Channel Electrical Characteristics (T_J=25 ° C , uness otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =-250uA	-100	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =-10V , I _D =-3A	---	180	220	mΩ
		V _{GS} =-4.5V , I _D =-2A	---	210	255	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-1.2	---	-2.5	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-80V , V _{GS} =0V , T _J =25°C	---	---	-1	uA
		V _{DS} =-80V , V _{GS} =0V , T _J =85°C	---	---	-30	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V , V _{DS} =0V	---	---	± 100	nA
R _g	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz	---	13	---	Ω
Q _g	Total Gate Charge (-10V)	V _{DS} =-50V , V _{GS} =-10V , I _D =-2A	---	19	---	nC
Q _{gs}	Gate-Source Charge		---	3.4	---	
Q _{gd}	Gate-Drain Charge		---	2.9	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =-30V , V _{GS} =-10V , R _G =3.3Ω, I _D =-1A	---	9	---	ns
T _r	Rise Time		---	6	---	
T _{d(off)}	Turn-Off Delay Time		---	39	---	
T _f	Fall Time		---	33	---	
C _{iss}	Input Capacitance	V _{DS} =-30V , V _{GS} =0V , f=1MHz	---	1228	---	pF
C _{oss}	Output Capacitance		---	41	---	
C _{rss}	Reverse Transfer Capacitance		---	29	---	
I _s	Continuous Source Current ^{1,5}	V _G =V _D =0V , Force Current	---	---	10.0	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V , I _S =-1A , T _J =25°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 ≤ 300us , duty cycle ≤ 2%
- 3.The EAS data shows Max. rating . The test condition is V_{DD}=-25V,V_{GS}=-10V,L=0.5mH,I_{AS}=-14A
- 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.



P-Channel Typical Characteristics

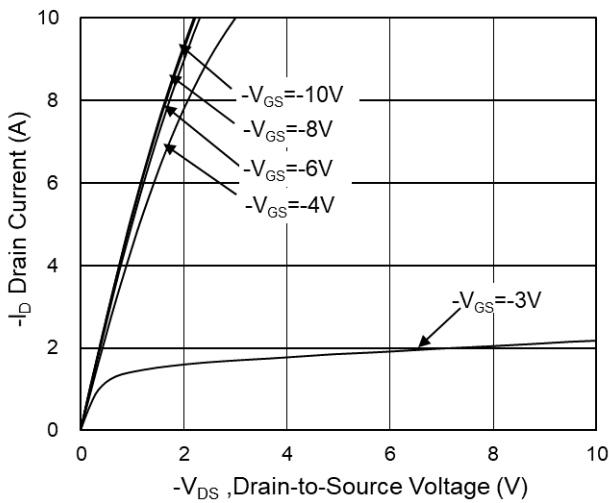


Fig.1 Typical Output Characteristics

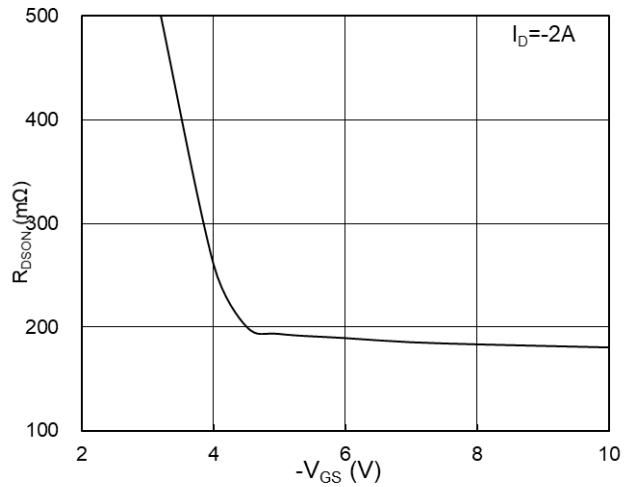


Fig.2 On-Resistance vs G-S Voltage

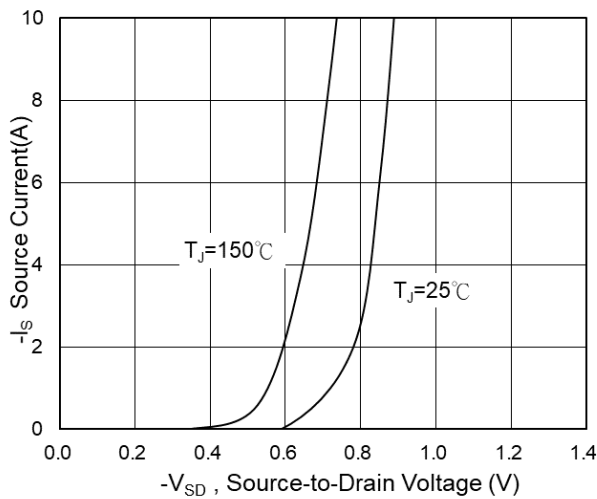


Fig.3 Source Drain Forward Characteristics

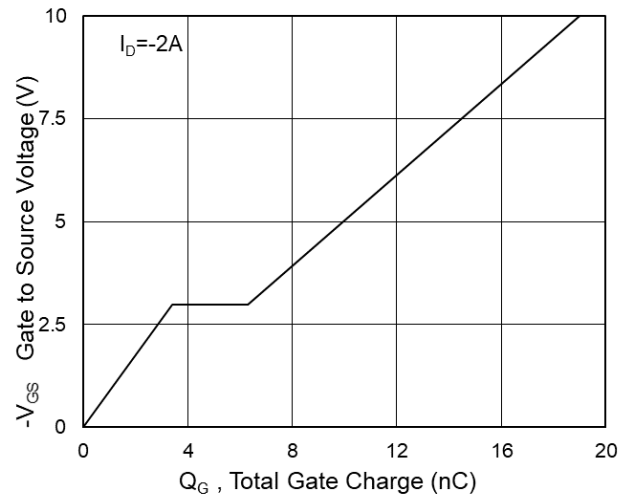


Fig.4 Gate-Charge Characteristics

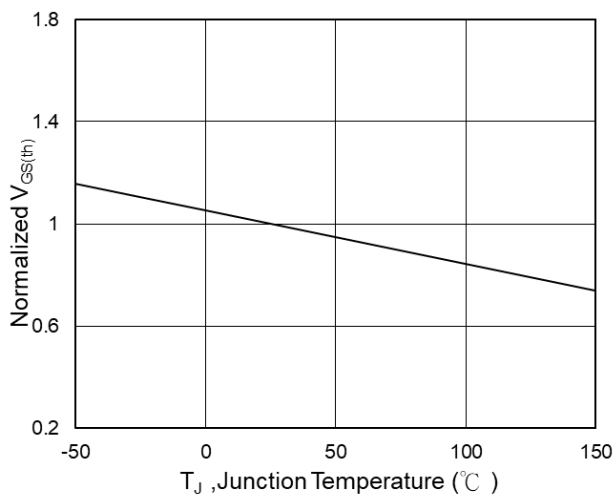


Fig.5 Normalized $V_{GS(th)}$ vs T_J

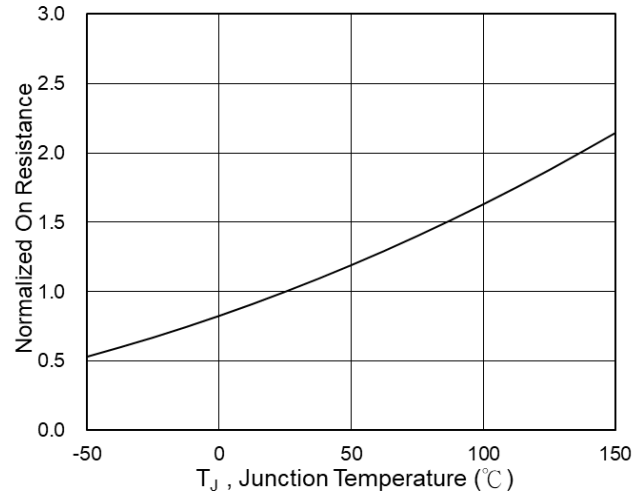


Fig.6 Normalized $R_{DS(on)}$ vs T_J

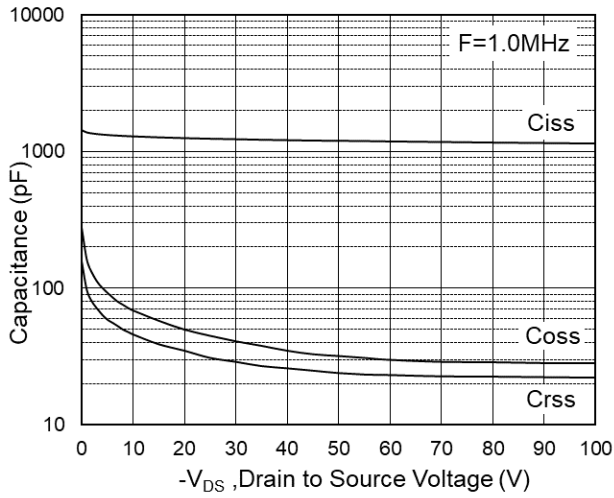


Fig.7 Capacitance

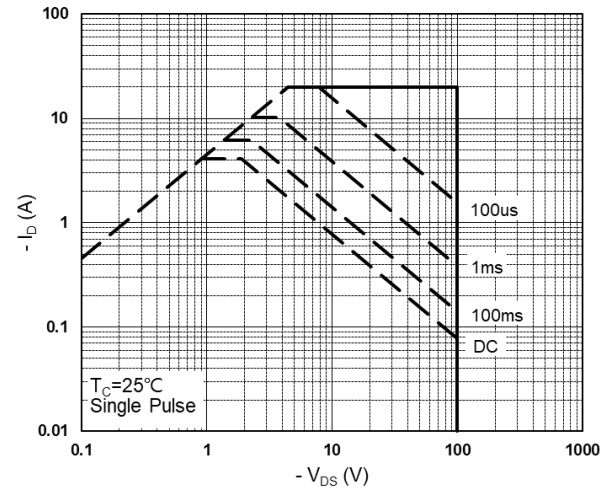


Fig.8 Safe Operating Area

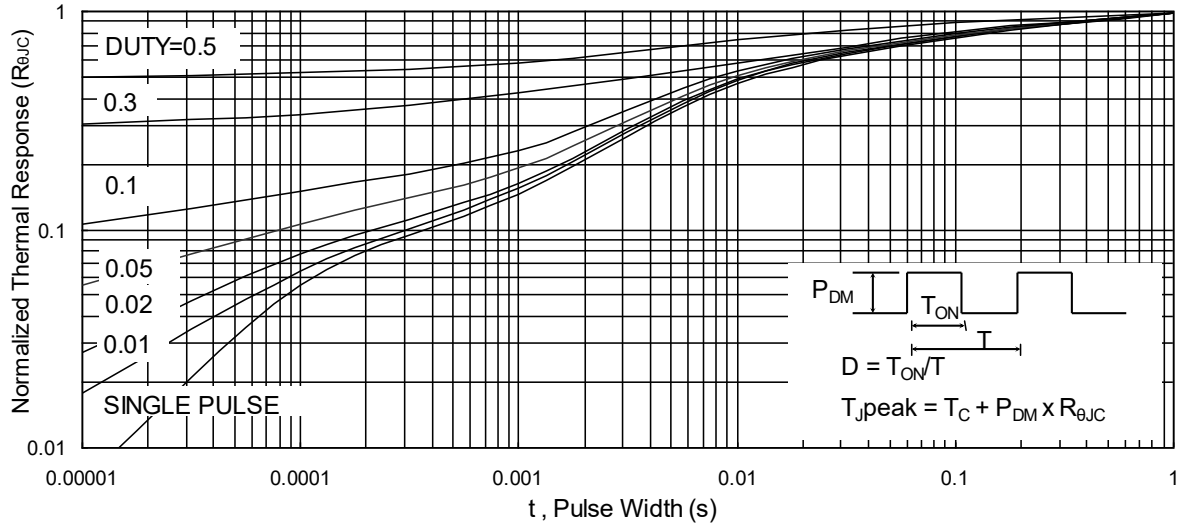


Fig.9 Normalized Maximum Transient Thermal Impedance

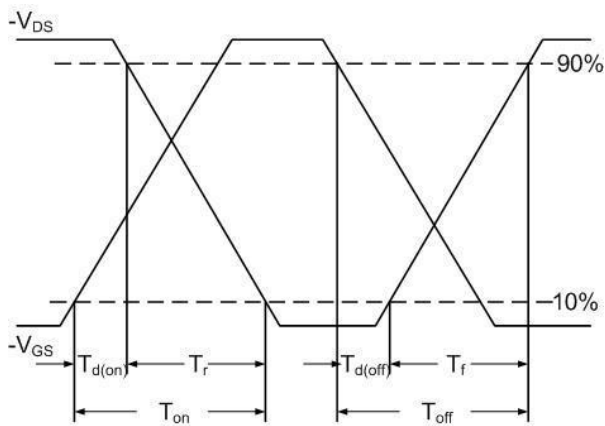


Fig.10 Switching Time Waveform

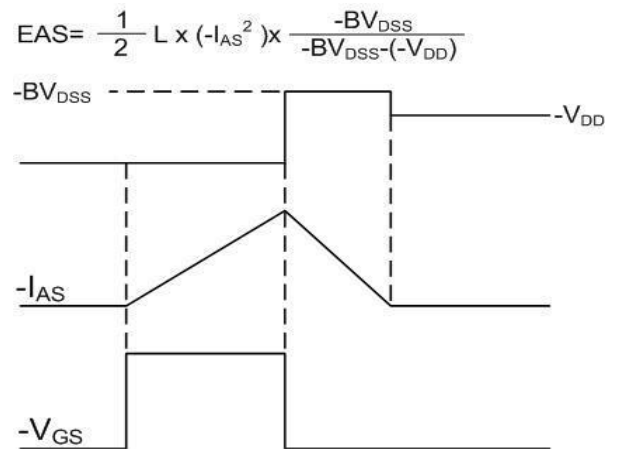
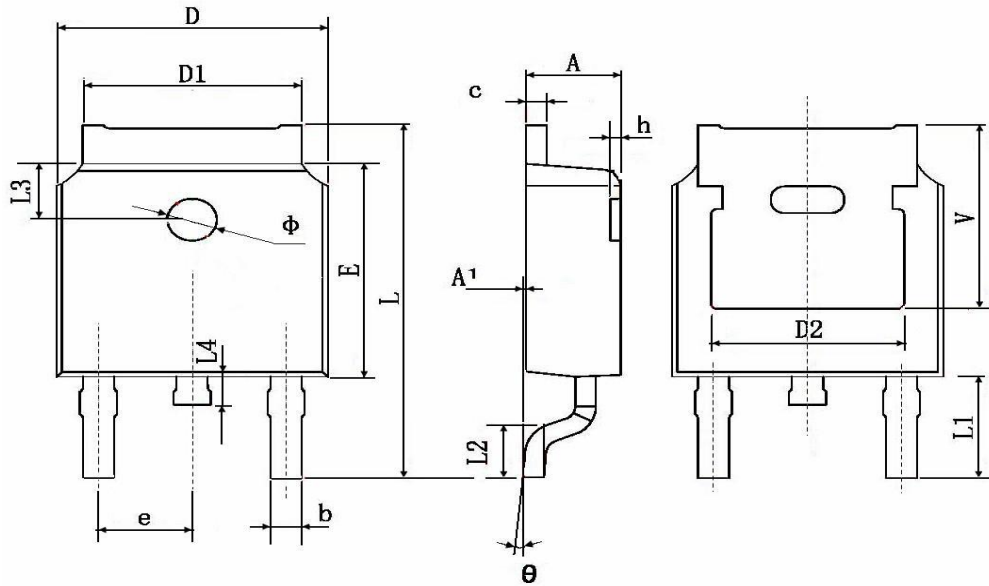


Fig.11 Unclamped Inductive Waveform



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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