



## Description

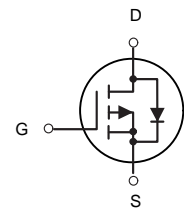
The HXY120P03D uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



## General Features

$V_{DS} = -30V$   $I_D = -120A$

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



P-Channel MOSFET

## Application

Lithium battery protection

Wireless impact

Mobile phone fast charging

## Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
HXY120P03D	TO252-2L	120P03 XXX YYYY	2500

## Absolute Maximum Ratings (TC=25°C unless otherwise noted)

Symbol	Parameter	Max.	Units
VDSS	Drain-Source Voltage	-30	V
VGSS	Gate-Source Voltage	±20	V
ID	Continuous Drain Current $T_C = 25^\circ C$	-120	A
ID	Continuous Drain Current $T_C = 100^\circ C$	-80	A
IDM	Pulsed Drain Current <sup>note1</sup>	-470	A
EAS	Single Pulsed Avalanche Energy <sup>note2</sup>	580	mJ
PD	Power Dissipation $T_C = 25^\circ C$	100	W
RθJC	Thermal Resistance, Junction to Case	1.4	°C/W
TJ, TSTG	Operating and Storage Temperature Range	-55 to +175	°C



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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V I <sub>D</sub> =-250μA	-30			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-30V, 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	-1.7	-2.5	V
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-20A		65		S
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =-10V, I <sub>D</sub> =-20A		3.7	4.5	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-20A		6	8.2	mΩ
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, f=1.0MHz		7000		pF
C <sub>oss</sub>	Output Capacitance			820		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			540		pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1.0MHz		2.2		Ω
Switching Parameters						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, R <sub>L</sub> =0.75Ω, R <sub>GEN</sub> =3Ω		14		nS
t <sub>r</sub>	Turn-on Rise Time			13		nS
t <sub>d(off)</sub>	Turn-Off Delay Time			65		nS
t <sub>f</sub>	Turn-Off Fall Time			37		nS
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-20A		130		nC
Q <sub>gs</sub>	Gate-Source Charge			12		nC
Q <sub>gd</sub>	Gate-Drain Charge			31		nC
Source-Drain Diode Characteristics						
I <sub>SD</sub>	Source-Drain Current (Body Diode)				-108	A
V <sub>SD</sub>	Forward on Voltage <sup>(Note 3)</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =-20A			-1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> =-20A, di/dt=100A/μs		30		ns
Q <sub>rr</sub>	Reverse Recovery Charge	I <sub>F</sub> =-20A, di/dt=100A/μs		40		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>=15V, 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 1. Output Characteristics

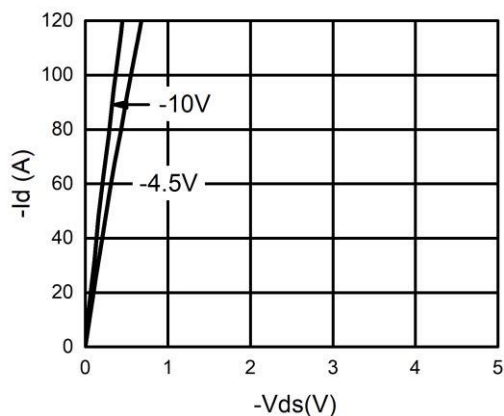


Figure 2. Transfer Characteristics

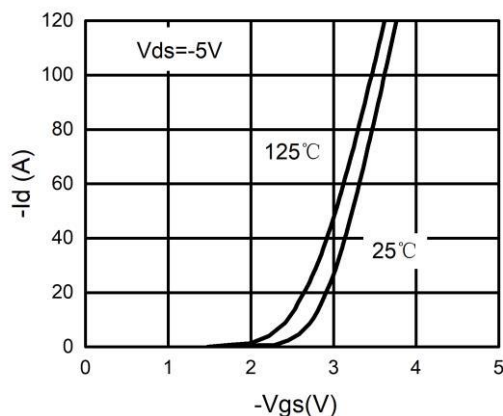


Figure 3. Power Dissipation

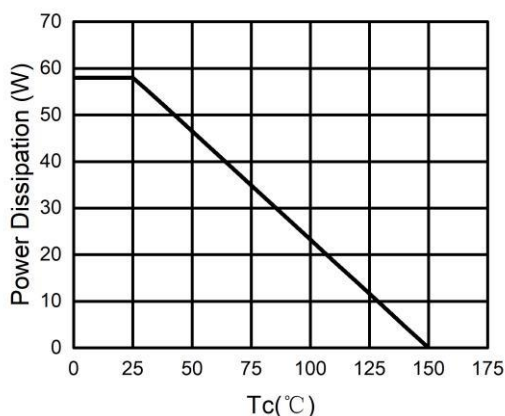


Figure 4. Drain Current

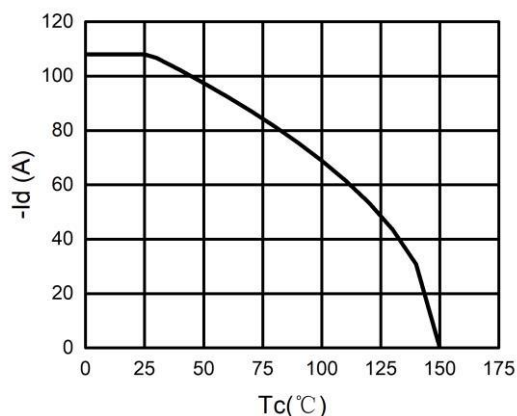


Figure 5.  $BV_{DSS}$  vs Junction Temperature

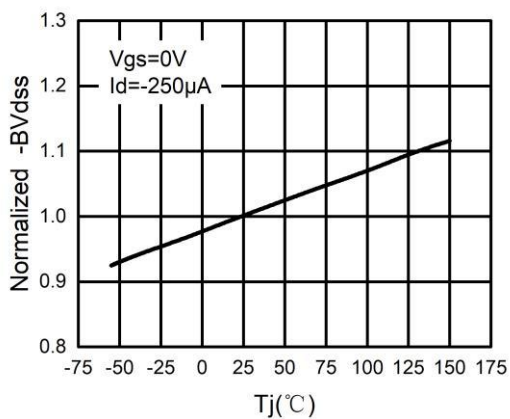


Figure 6.  $R_{DS(ON)}$  vs Junction Temperature

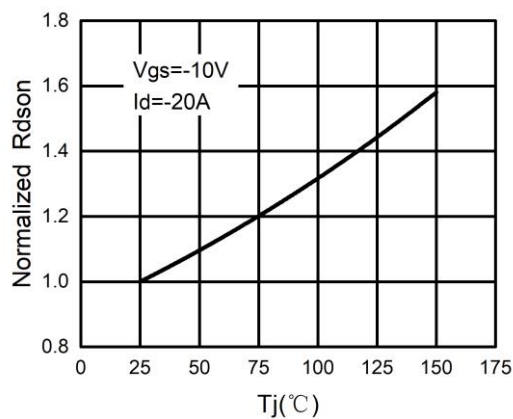




Figure 7. Gate Charge Waveforms

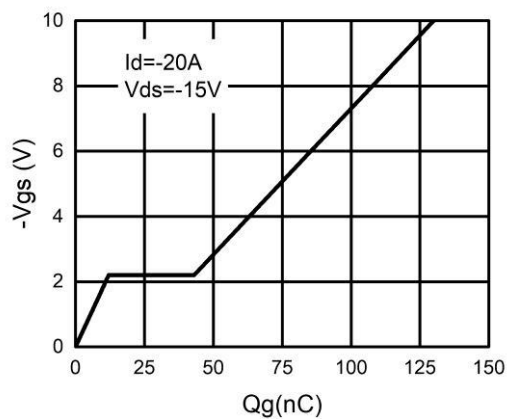


Figure 8. Capacitance

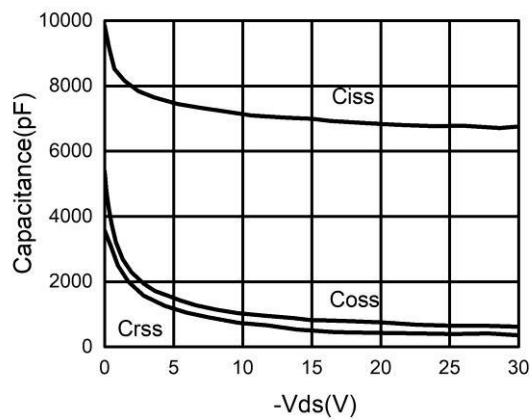


Figure 9. Body-Diode Characteristics

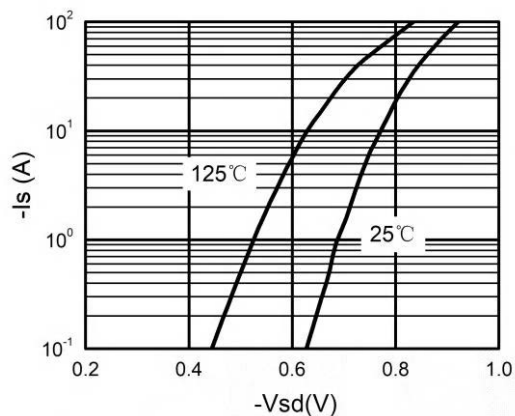
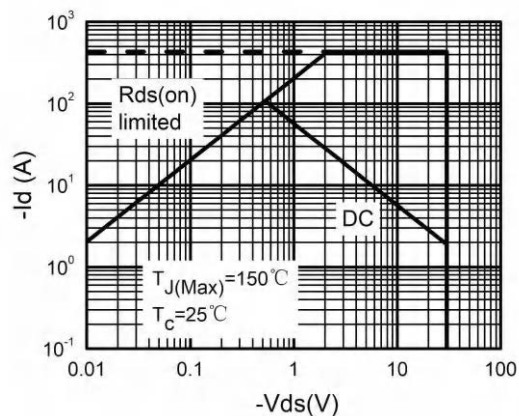
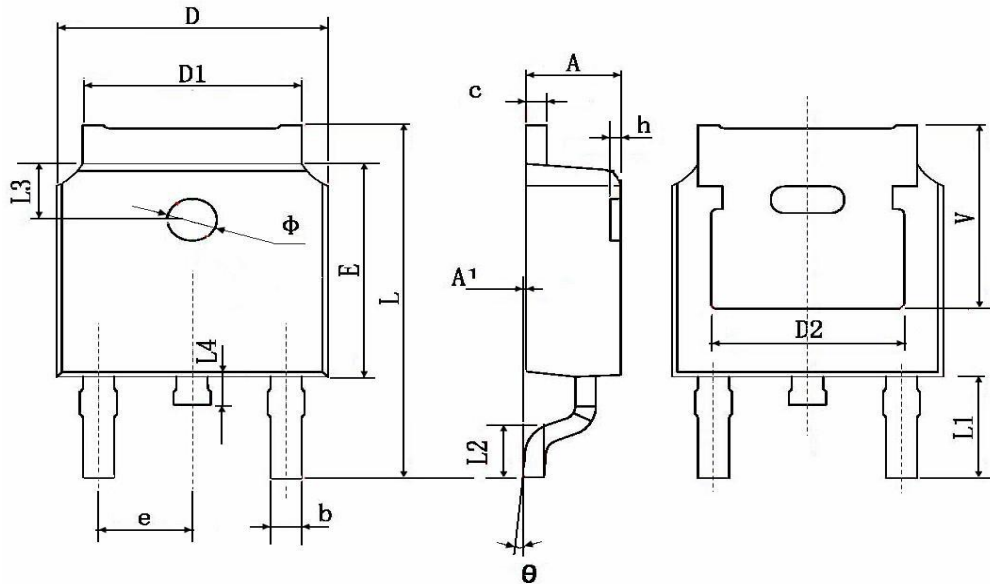


Figure 10. Maximum Safe Operating Area





## TO252-2L 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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