



Description

The HXY60N02D 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

$V_{DS} = 20V$ $I_D = 60A$

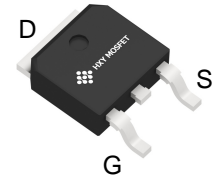
$R_{DS(ON)} < 6m\Omega @ V_{GS}=4.5V$

Application

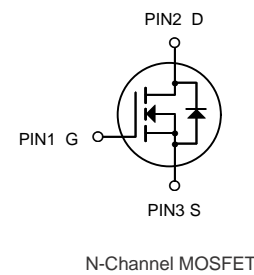
Battery protection

Load switch

Uninterruptible power supply



TO-252-2L



Ordering Information

Product ID	Pack	Brand	Qty(PCS)
HXY60N02D	TO-252-2L	HXY MOSFET	2500

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

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Drain Current-Continuous	60	A
$I_D(100^\circ C)$	Drain Current-Continuous($T_c=100^\circ C$)	42	A
I_{DM}	Pulsed Drain Current	210	A
P_D	Maximum Power Dissipation	60	W
	Derating factor	0.48	W/ $^\circ C$
EAS	Single pulse avalanche energy (Note 5)	200	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ C$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case (Note 2)	2.1	$^\circ C/W$



Electrical Characteristics (T_c=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250μA	20	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.5	0.75	1.0	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =20 A	-	4.5	6	mΩ
		V _{GS} =2.5V, I _D =15A	-	5.3	8.2	mΩ
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =20A	15	-	-	S
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, F=1.0MHz	-	2000	-	PF
Output Capacitance	C _{oss}		-	500	-	PF
Reverse Transfer Capacitance	C _{rss}		-	200	-	PF
Turn-on Delay Time	t _{d(on)}	V _{DD} =10V, I _b =2A, R _L =1Ω V _{GS} =4.5V, R _G =3Ω	-	6.4	-	nS
Turn-on Rise Time	t _r		-	17.2	-	nS
Turn-Off Delay Time	t _{d(off)}		-	29.6	-	nS
Turn-Off Fall Time	t _f		-	16.8	-	nS
Total Gate Charge	Q _g	V _{DS} =10V, I _D =20A, V _{GS} =10V	-	27	-	nC
Gate-Source Charge	Q _{gs}		-	6.5	-	nC
Gate-Drain Charge	Q _{gd}		-	6.4	-	nC
Diode Forward Voltage ^(Note 3)	V _{SD}	V _{GS} =0V, I _S =10A	-	-	1.2	V
Diode Forward Current ^(Note 2)	I _S		-	-	60	A
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F = 20A di/dt = 100A/μs ^(Note3)	-	25	-	nS
Reverse Recovery Charge	Q _{rr}		-	24	-	nC
Forward Turn-On Time	t _{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. E_{AS} condition : T_J=25°C, V_{DD}=10V, V_G=10V, L=0.5mH, R_G=25Ω.



Typical Electrical and Thermal Characteristics (Curves)

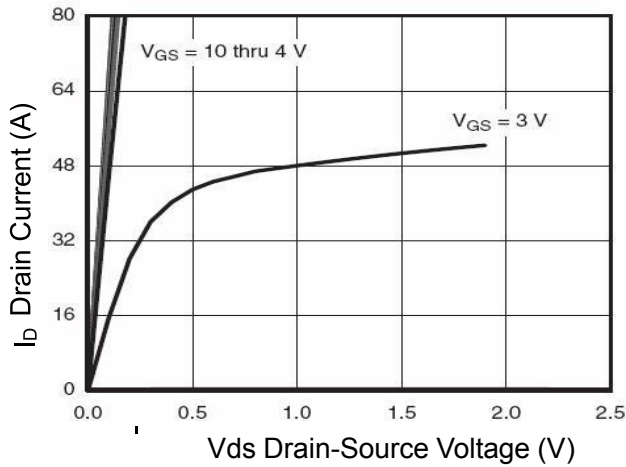


Figure 1 Output Characteristics

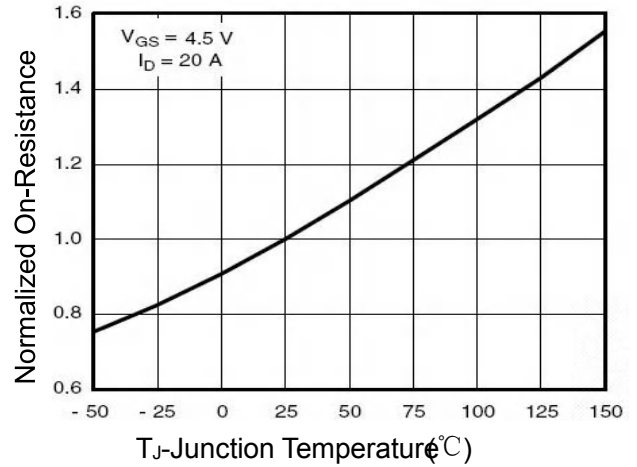


Figure 4 R_{dson} -Junction Temperature

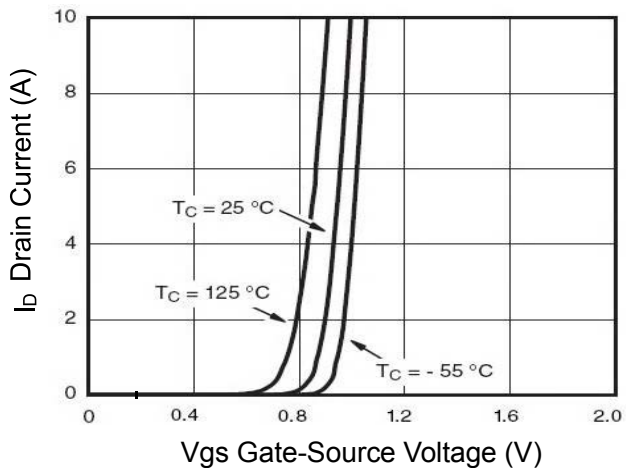


Figure 2 Transfer Characteristics

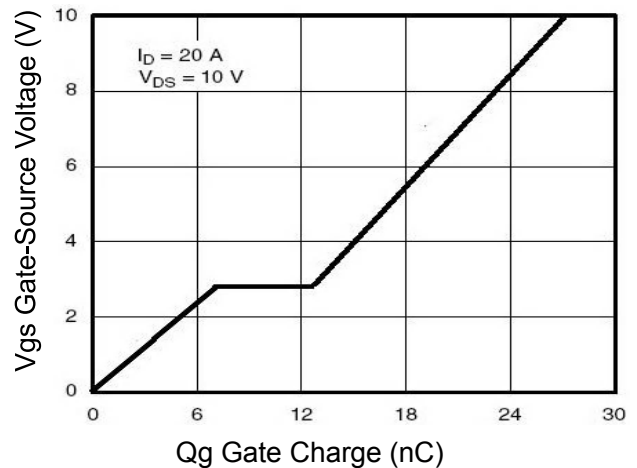


Figure 5 Gate Charge

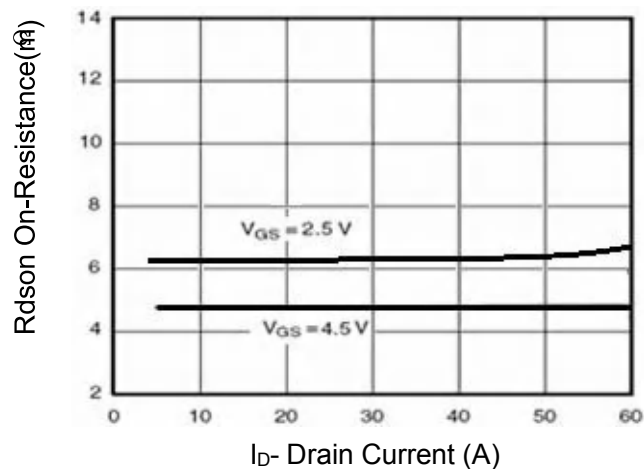


Figure 3 R_{dson} - Drain Current

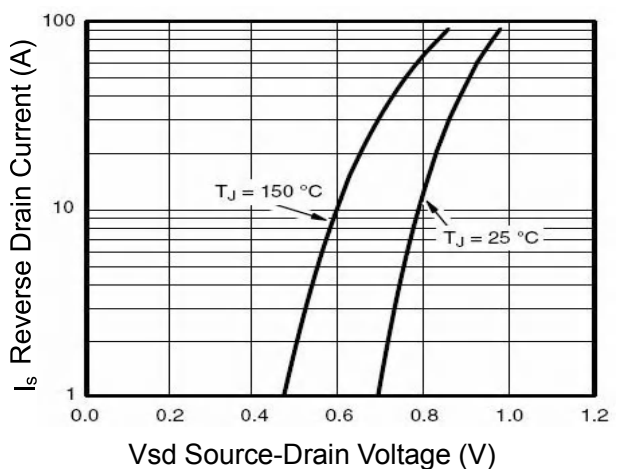
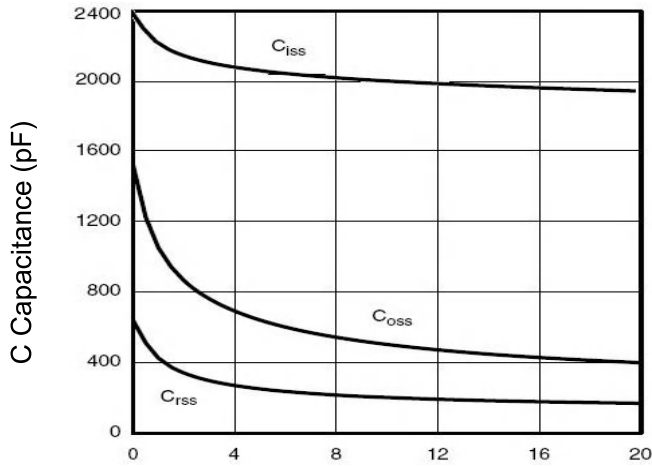
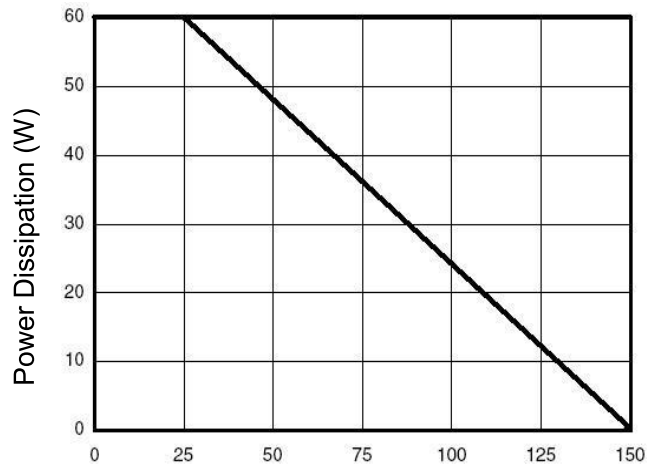


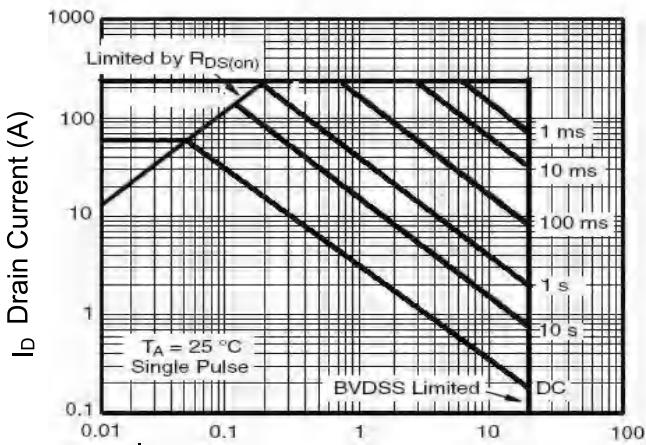
Figure 6 Source- Drain Diode Forward



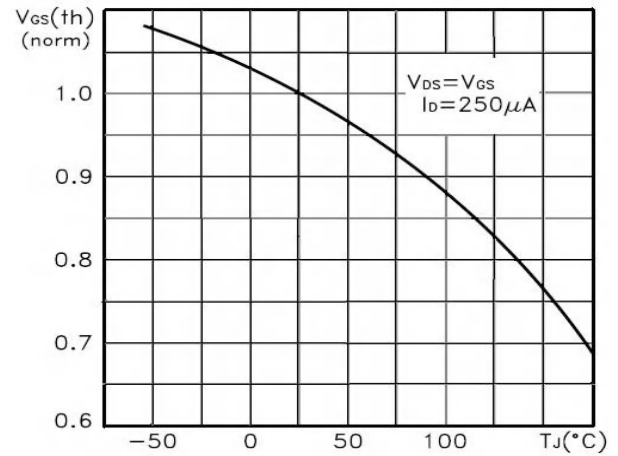
Vds Drain-Source Voltage (V)
Figure 7 Capacitance vs Vds



TJ-Junction Temperature (°C)
Figure 9 Power De-rating



Vds Drain-Source Voltage (V)
Figure 8 Safe Operation Area



TJ-Junction Temperature(°C)
Figure 10 VGS(th) vs Junction Temperature

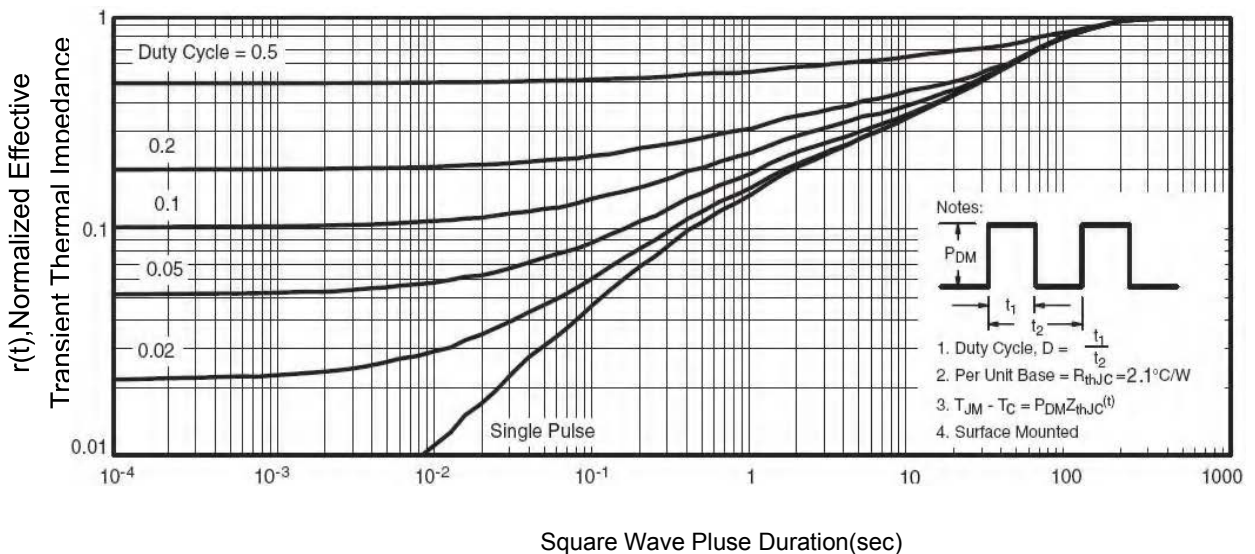


Figure 11 Normalized Maximum Transient Thermal Impedance



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