



Description

The HXY40N02D uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. The complementary MOSFETs may be used to form a level shifted high side switch, and for a host of other applications.

General Features

$V_{DS} = 20V, I_D = 40A$

$R_{DS(ON)} < 9 m\Omega @ V_{GS}=4.5V$

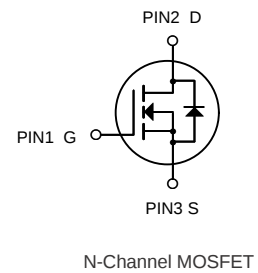
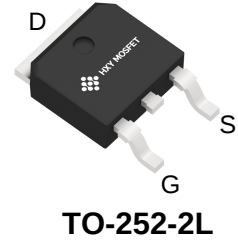
High power and current handling capability

Lead free product is acquired

Surface mount package

Application

- Power switching application
- Hard Switched and High Frequency Circuits
- Uninterruptible Power Supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
HXY40N02D	TO-252-2L	40N02 XXXX	2500

Absolute Maximum Ratings @T_j=25°C (unless otherwise specified)

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	20	V
V _{GS}	Gate-Source Voltage	±12	V
I _D @T _C =25°C	Drain Current, V _{GS} @ 4.5V	40	A
I _D @T _C =100°C	Drain Current, V _{GS} @ 4.5V	25	A
I _{DM}	Pulsed Drain Current	80	A
P _D @T _C =25°C	Total Power Dissipation	15.6	W
P _D @T _A =25°C	Total Power Dissipation	5	W
E _{AS}	Single Pulse Avalanche Energy	150	mJ
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C
R _{thj-c}	Maximum Thermal Resistance, Junction-case	8	°C/W
R _{thj-a}	Maximum Thermal Resistance, Junction-ambient	25	°C/W



Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	20	-	-	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =4.5V, I _D =20A	-	7.5	9	mΩ
		V _{GS} =2.5V, I _D =12A	-	9.1	12	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	0.5	-	0.9	V
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =20A	-	50	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =16V, V _{GS} =0V	-	-	10	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
Q _g	Total Gate Charge	I _D =20A	-	16	25.6	nC
Q _{gs}	Gate-Source Charge	V _{DS} =10V	-	3	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =4.5V	-	4.5	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DS} =10V	-	10	-	ns
t _r	Rise Time	I _D =1A	-	13	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.3Ω	-	28	-	ns
t _f	Fall Time	V _{GS} =5V	-	7	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	1400	2240	pF
C _{oss}	Output Capacitance	V _{DS} =10V	-	170	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	135	-	pF
R _g	Gate Resistance	f=1.0MHz	-	1	2	Ω
V _{SD}	Forward On Voltage ²	I _S =20A, V _{GS} =0V	-	-	1.2	V
t _{rr}	Reverse Recovery Time	I _S =12A, V _{GS} =0V,	-	8.5	-	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	2.5	-	nC

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in² copper pad of FR4 board, t <10sec ; 60 °C/W at steady state.
- 4.Starting T_j=25°C , V_{DD}=20V , L=0.1mH , R_G=25Ω, V_{GS}=10V



Typical Characteristics

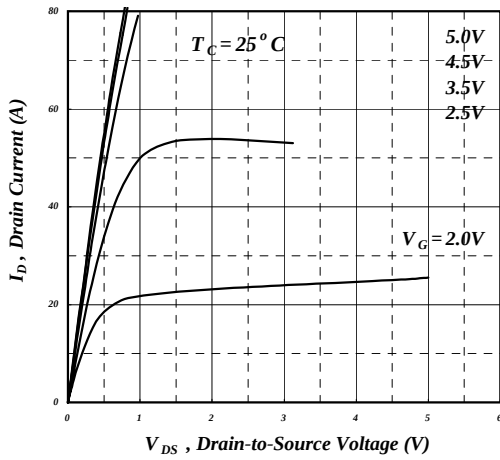


Fig 1. Typical Output Characteristics

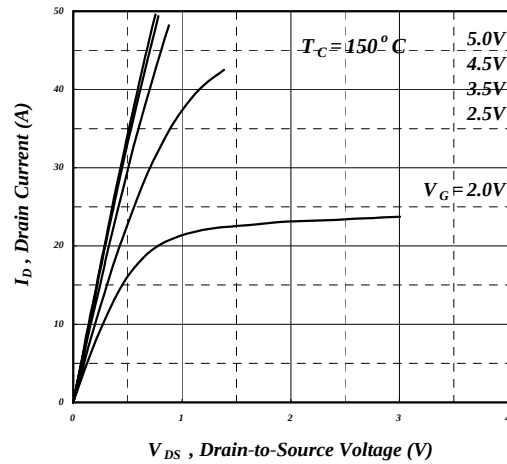


Fig 2. Typical Output Characteristics

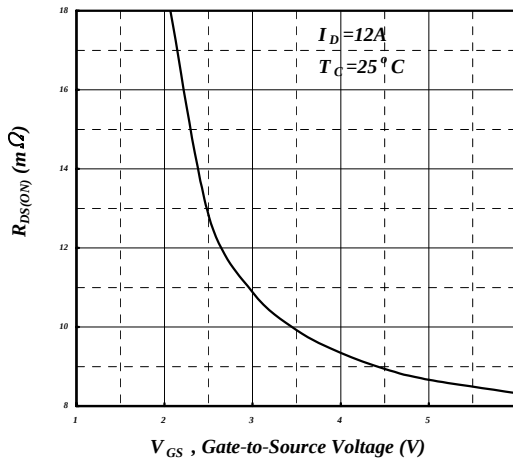


Fig 3. On-Resistance v.s. Gate Voltage

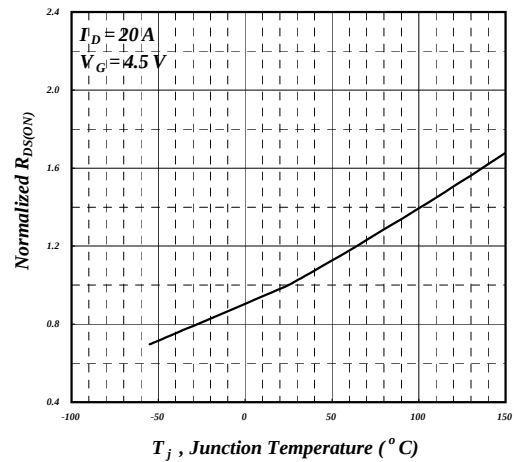


Fig 4. Normalized On-Resistance
v.s. Junction Temperature

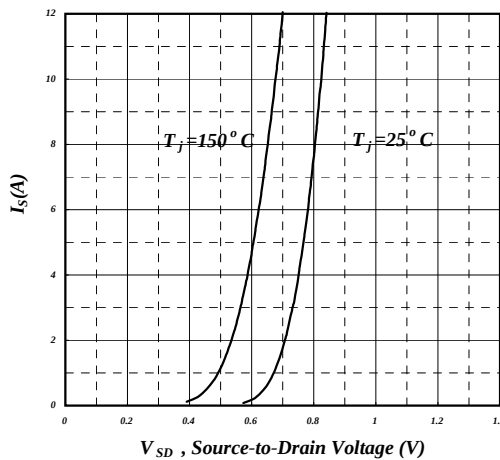


Fig 5. Forward Characteristic of
Reverse Diode

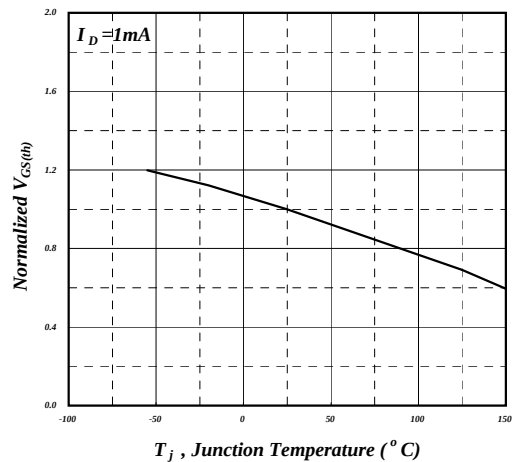


Fig 6. Gate Threshold Voltage v.s.
Junction Temperature

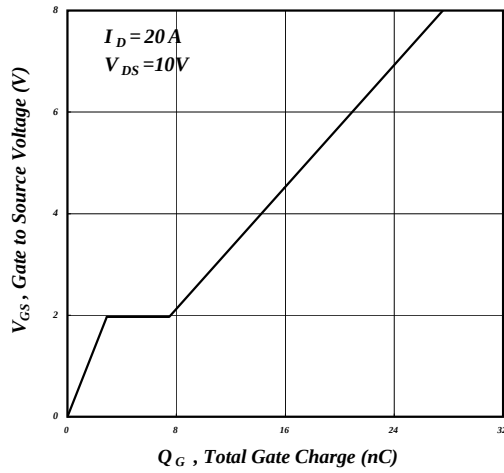


Fig 7. Gate Charge Characteristics

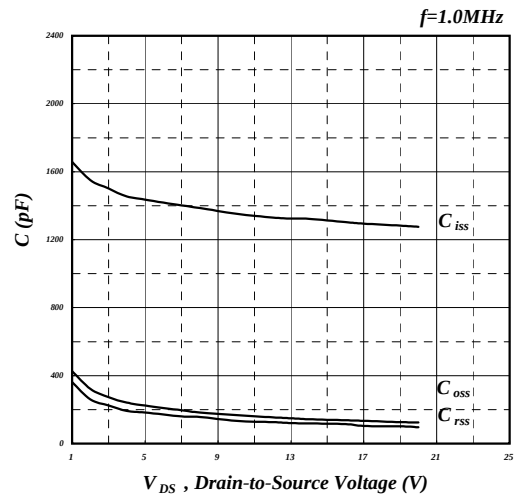


Fig 8. Typical Capacitance Characteristics

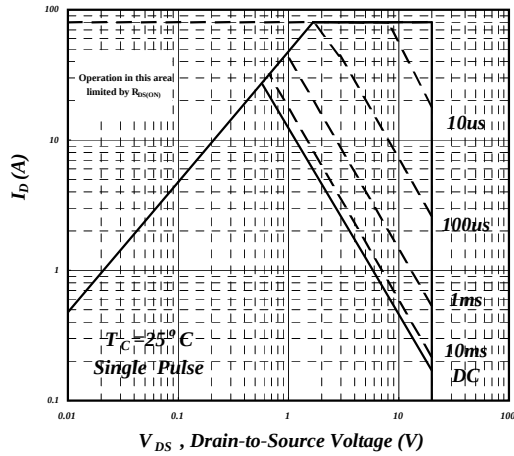


Fig 9. Maximum Safe Operating Area

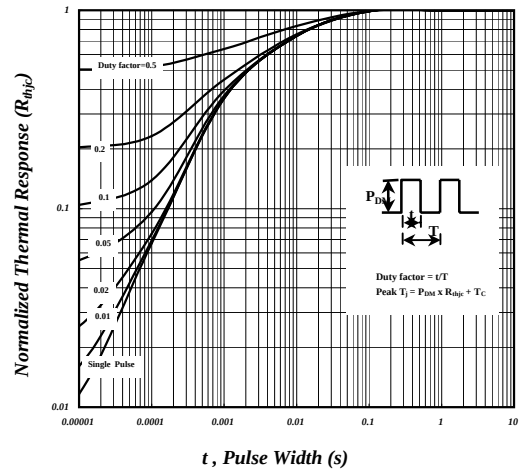


Fig 10. Effective Transient Thermal Impedance

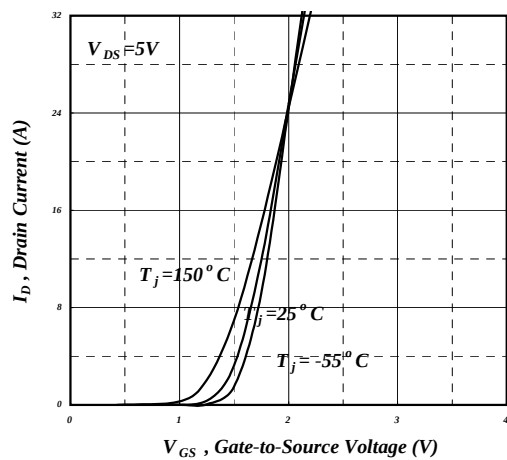


Fig 11. Transfer Characteristics

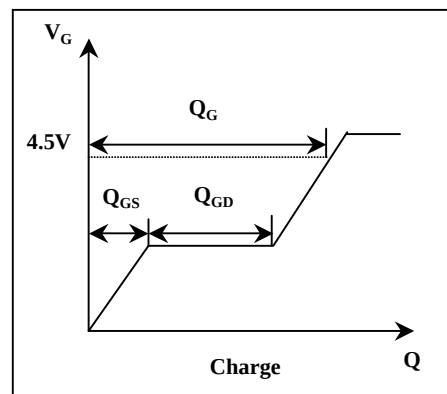


Fig 12. Gate Charge Waveform

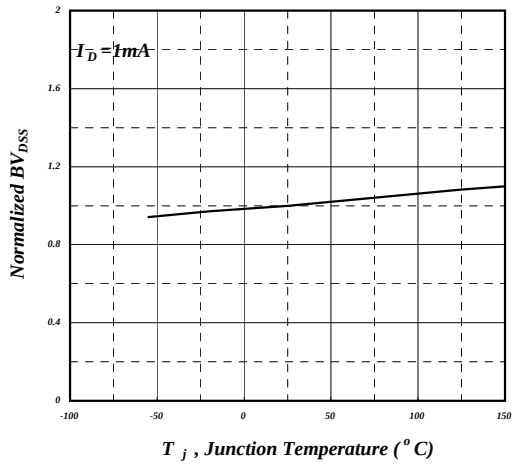


Fig 13. Normalized BV_{DSS} v.s. Junction Temperature

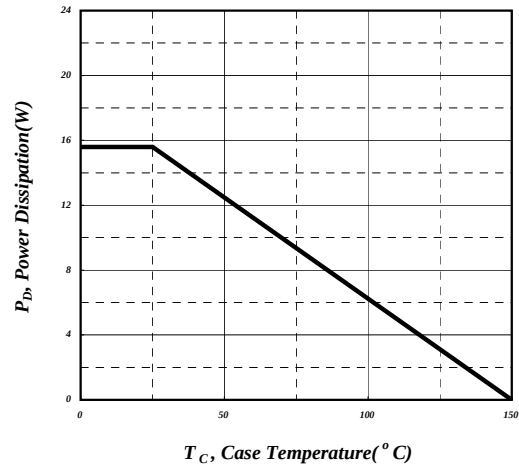


Fig 14. Total Power Dissipation

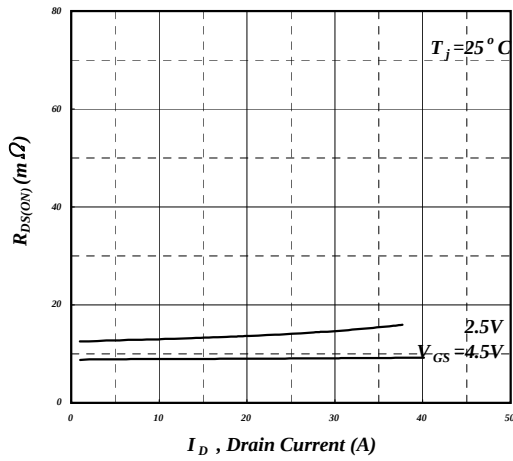
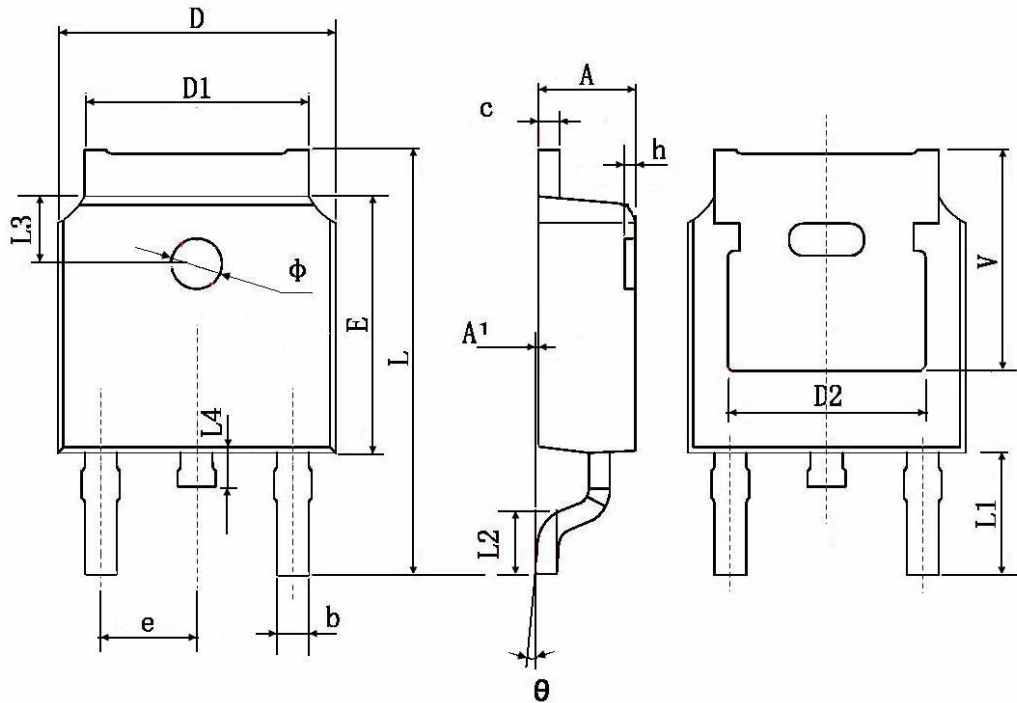


Fig 15. Typ. Drain-Source on State Resistance

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	0.483 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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