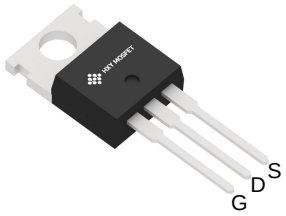
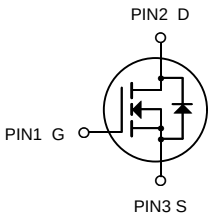
Description

The HXYG45N10P use advanced SGT MOSFET technology to provide low RDS(ON), low gate charge, fast switching and excellent avalanche characteristics.

This device is specially designed to get better ruggedness.



TO-220



N-Channel MOSFET

General Features

V_{DS} =100V,I_D =45A

$R_{DS(ON)}$ <16mΩ @ V_{GS}=10V

Application

Power switch

DC/DC converters

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
HXYG45N10P	TO-220	45N10 XXXX	50

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

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		100	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current		45	A
I_{DM}	Pulsed Drain Current note1		135	A
E_{AS}	Single Pulsed Avalanche Energy note2		18	mJ
P_D	Power Dissipation	T_C = 25°C	95	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.45	°C/ W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	°C

Electrical Characteristics T_J = 25°C unless otherwise noted

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0 V, I_D=250uA	100	---	---	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1.0	---	3.0	V
Drain-source leakage current	I_{DSS}	V_{DS}=100V, V_{GS}=0V, T_J = 25°C	---	---	1	μA
		V_{DS}=80V, V_{GS}=0V, T_J = 125°C	---	---	10	μA
Gate leakage current, Forward	I_{GSSF}	V_{GS}=20 V, V_{DS}=0 V	---	---	100	nA
Gate leakage current, Reverse	I_{GSSR}	V_{GS}=-20 V, V_{DS}=0 V	---	---	-100	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=10 V, I_D=16 A	---	13.9	16	mΩ
		V_{GS}=4.5 V, I_D=8 A	---	18.1	23	mΩ
Forward transconductance	g_{fs}	V_{DS} =10V , I_D=10A	---	60	---	S
Dynamic characteristics						
Input capacitance	C_{iss}	V_{DS} = 50 V, V_{GS} = 0 V, F = 1MHz	---	916	---	pF
Output capacitance	C_{oss}		---	484	---	
Reverse transfer capacitance	C_{rss}		---	36	---	
Turn-on delay time	$t_{d(on)}$	V_{DD} = 50V,V_{GS}=10V, I_D = 25A	---	17.3	---	ns
Rise time	t_r		---	4.3	---	
Turn-off delay time	$t_{d(off)}$		---	30.5	---	
Fall time	t_f		---	5.7	---	
Gate resistance	R_g	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	1.5	---	Ω
Gate charge characteristics						
Gate to source charge	Q_{gs}	V_{DS}=50 V, I_D=25A, V_{GS}= 10 V	---	15.6	---	nC
Gate to drain charge	Q_{gd}		---	2.8	---	
Gate charge tota	Q_g		---	3.2	---	
Drain-Source diode characteristics and Maximum Ratings						
Diode Forward Voltage[4)]	V_{SD}	V_{GS}=0V, I_S=50A, T_J=25℃	---	---	1.3	V
Reverse Recovery Time	t_{rr}	I_S=20A, di/dt=60A/us, T_J=25℃	---	52	---	ns
Reverse Recovery Charge	Q_{rr}		---	61.6	---	nC

Notes:

1: The maximum junction current rating is package limited.

2: Repetitive Rating: Pulse width limited by maximum junction temperature.

3: V_{DD}=50V, V_{GS}=10V, L=0.5mH, I_{AS}=31A, R_G=25Ω, Starting T_J=25°C.

4: Pulse Test：Pulse Width ≤300 μs, Duty Cycle≤2%.

Typical Performance Characteristics

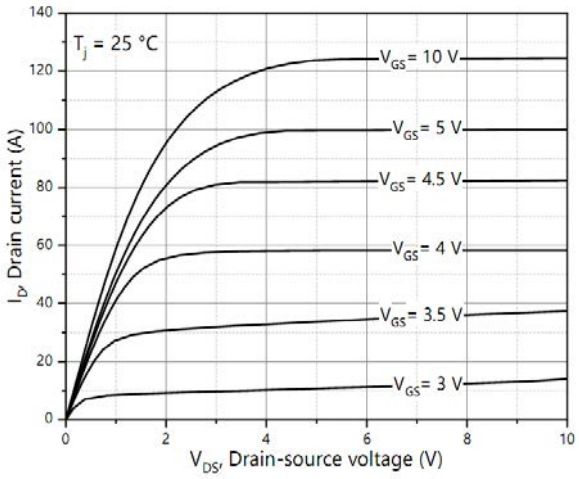


Figure 1. Typ. output characteristics

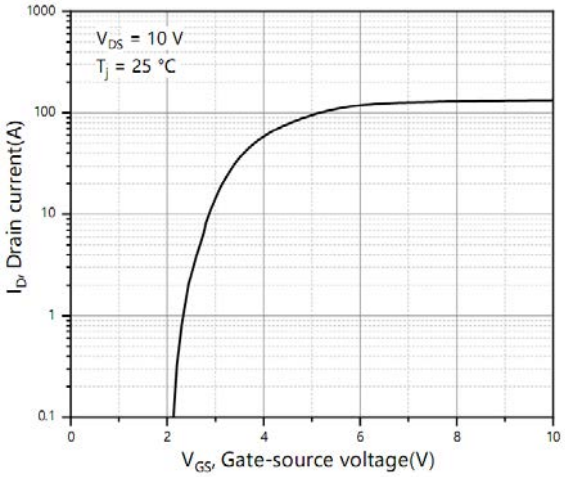


Figure 2. Typ. transfer characteristics

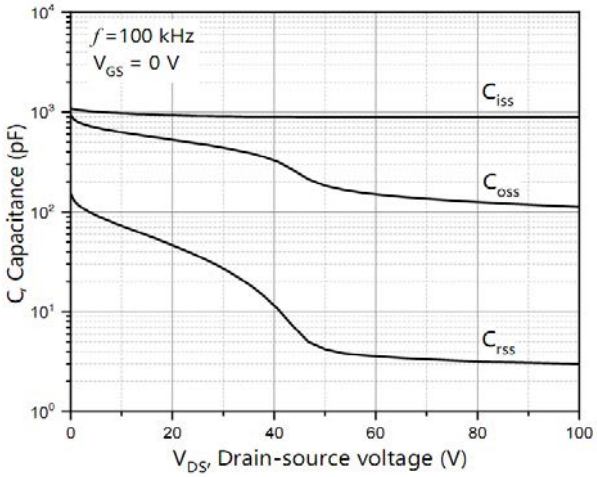


Figure 3. Typ. capacitances

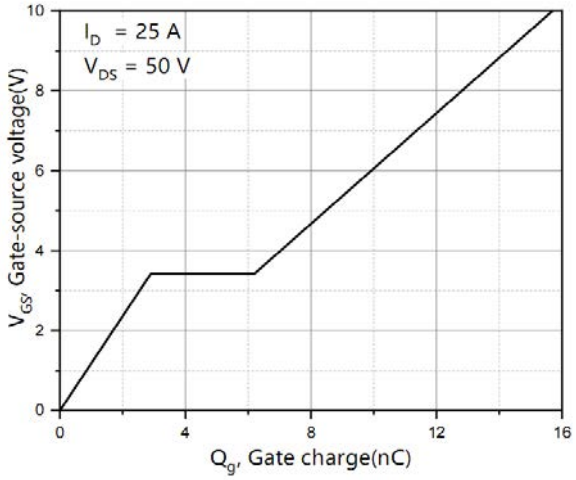


Figure 4. Typ. gate charge

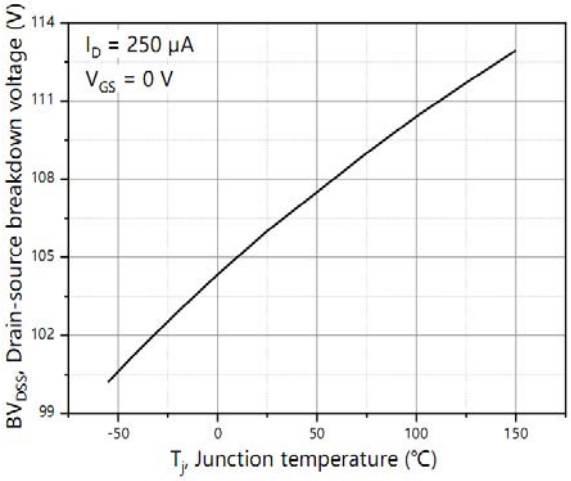


Figure 5. Drain-source breakdown voltage

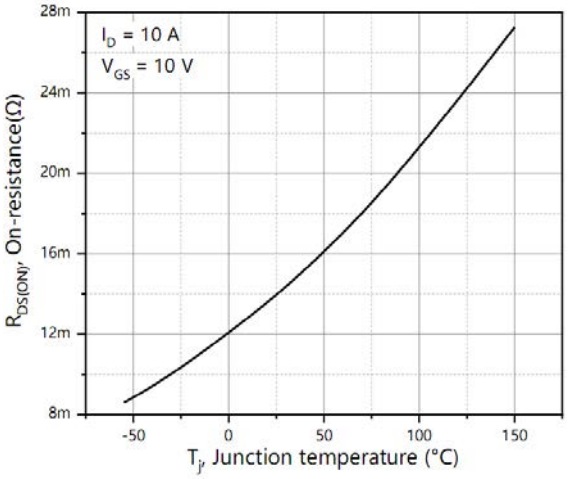


Figure 6. Drain-source on-state resistance

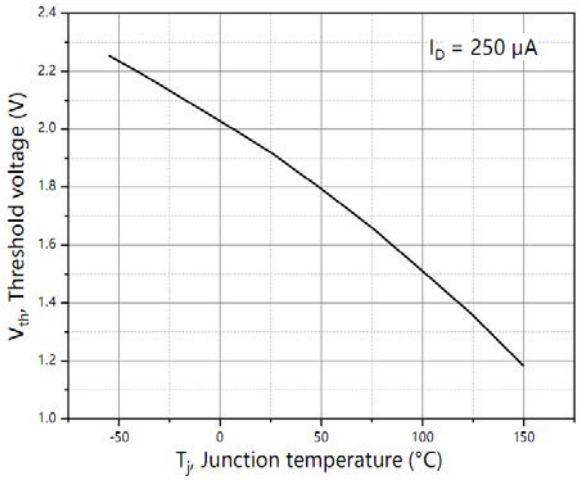


Figure 7. Threshold voltage

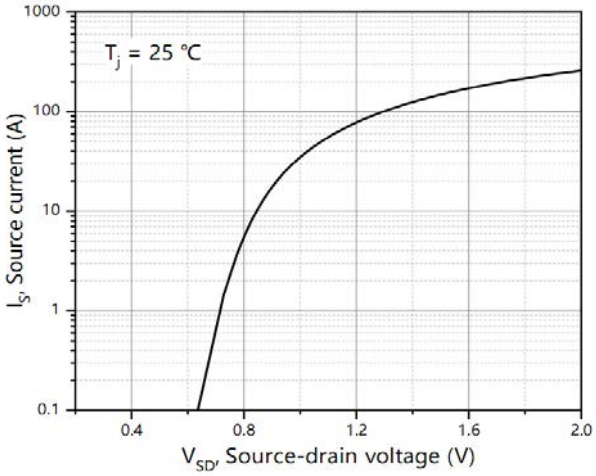


Figure 8. Forward characteristic of body diode

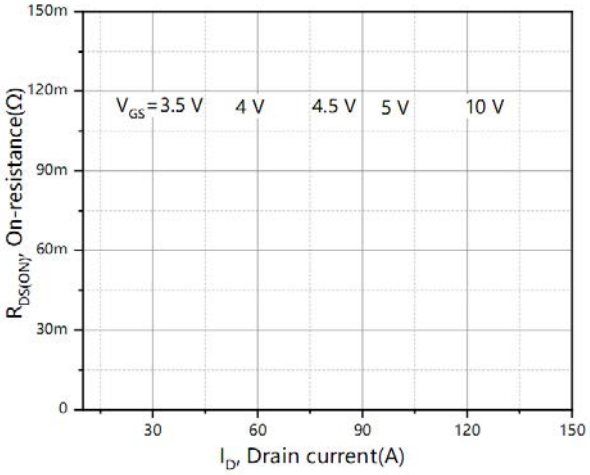


Figure 9. Drain-source on-state resistance

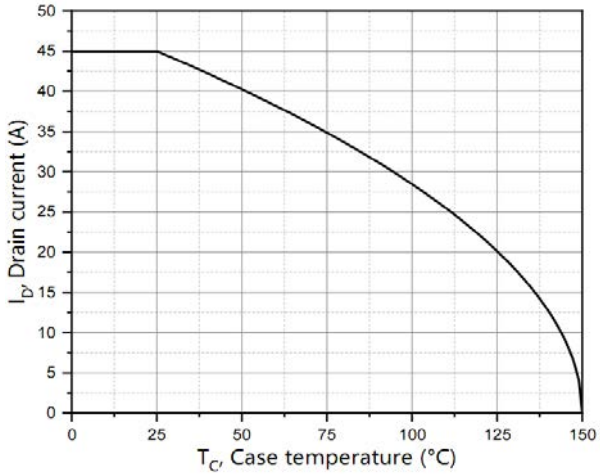


Figure 10. Drain current

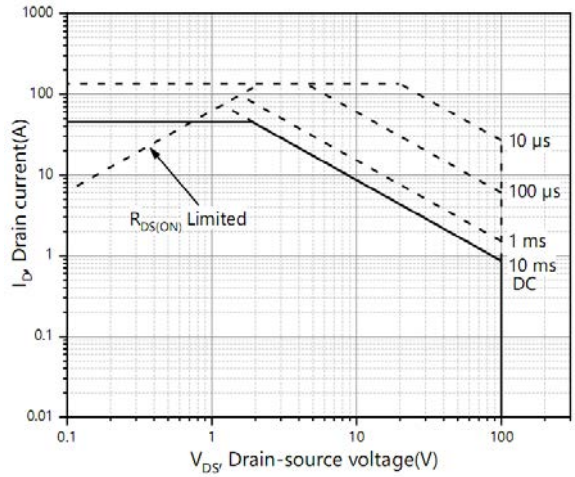


Figure 11. Safe operation area T_C=25 °C

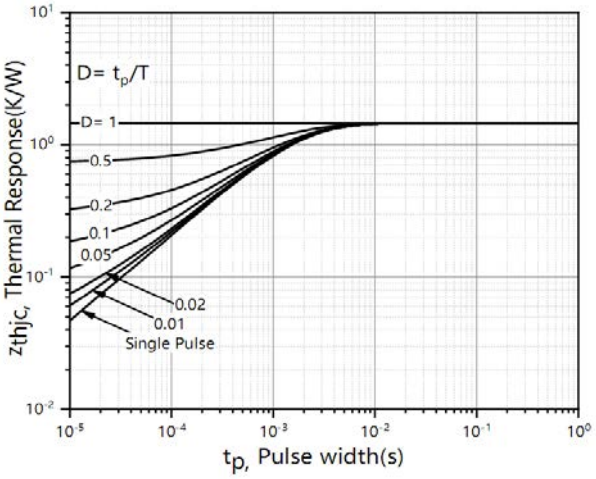
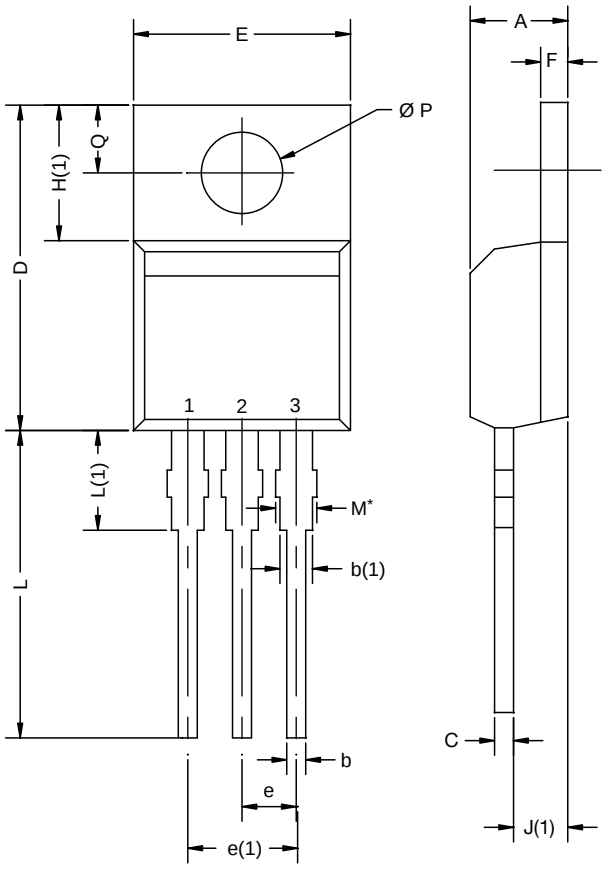


Figure 12. Max. transient thermal impedance

TO-220 Package Information



DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.25	4.65	0.167	0.183
b	0.69	1.01	0.027	0.040
b(1)	1.20	1.73	0.047	0.068
c	0.36	0.61	0.014	0.024
D	14.85	15.49	0.585	0.610
E	10.04	10.51	0.395	0.414
e	2.41	2.67	0.095	0.105
e(1)	4.88	5.28	0.192	0.208
F	1.14	1.40	0.045	0.055
H(1)	6.09	6.48	0.240	0.255
J(1)	2.41	2.92	0.095	0.115
L	13.35	14.02	0.526	0.552
L(1)	3.32	3.82	0.131	0.150
Ø P	3.54	3.94	0.139	0.155
Q	2.60	3.00	0.102	0.118
ECN: X12-0208-Rev. N, 08-Oct-12 DWG: 5471				

Notes

* M = 1.32 mm to 1.62 mm (dimension including protrusion) Heatsink hole for HVM

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