芯亿达电子

XYD060N100

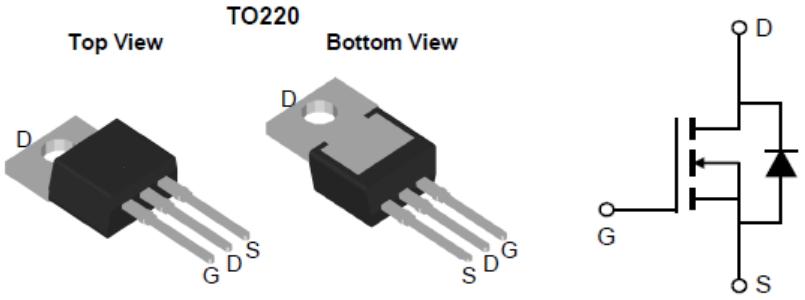
100V N-channel Shielding Gate MOSFET

Features

- N-channel, normal level
- Excellent Gate charge × $R_{DS(on)}$ (FOM)
- Very low on-resistance $R_{DS(on)}$

This chip is used for:

- Industrial power supplies
- Boost converters
- Rectifier
- Telecom
- Industrial power supplies



Symbol	Parameter	Value	Units
V_{DS}	Drain-Source Voltage	100	V
I_D	Drain Current - Continuous (TC= 25°C)	120	A
	Drain Current - Continuous (TC= 100°C)	90	A
I_{DM}	Drain Current - Pulsed (Note 1)	220	A
V_{GS}	Gate-Source Voltage	± 20	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	136	mJ
P_D	Power Dissipation (TC = 25°C)	162	W
T_j , T_{stg}	Operating and Storage Temperature Range	-55 to +175	°C

* Drain current limited by maximum junction temperature

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.60	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	50	°C/W

Electrical Characteristics T_C = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 µA	105			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 85 V, V_{GS} = 0 V			1	µA
I_{GSS}	Gate Leakage Current	V_{GS} = 20 V, V_{DS} = 0 V			100	nA
On Characteristics						
$V_{GS(TH)}$	Gate Threshold voltage	V_{DS} = V_{GS}, I_D = 250 uA	2.5	3	3.5	V
$R_{DS(On)}$	Drain-Source on-state resistance	V_{GS} = 10 V, I_D = 50 A		5.8	6.2	mΩ
g_{FS}	Forward Transconductance	V_{DS} = 10 V, I_D = 50 A (Note 3)		83		S
Dynamic Characteristics						
C_{iss}	Input capacitance	VGS=0V, VDS=40V, f=1MHz		2256		pF
C_{oss}	Output capacitance			483		pF
C_{rss}	Reverse transfer capacitance			15		pF
Switching Characteristics						
$t_{d(on)}$	Turn On Delay Time	V_{DS} = 40 V, ID = 50 A, V_{GS} = 10 V, R_G = 4.7 Ω (Note 3, 4)		19		ns
t_r	Rising Time			33		ns
$t_{d(off)}$	Turn Off Delay Time			29		ns
t_f	Fall Time			19		ns
Q_g	Total Gate Charge	V_{DS} = 40 V, ID = 50 A, V_{GS} = 10 V (Note 3, 4)		38		nC
Q_{gs}	Gate-Source Charge			6		nC
Q_{gd}	Gate-Drain Charge			19		nC
R_g	Gate Resistance	V_{DS} = 0 V, Scan F mode		2.3		Ω
Drain-Source Diode Characteristics and Maximum Ratings						
V_{SD}	Diode Forward Voltage	V_{GS}= 0 V, I_S = 100A			1.2	V
T_{rr}	Reverse recovery time	I_S=50A, V_{GS} = 0V, dI_F/dt = 100A/us		37		ns
Q_{rr}	Reverse recovery charge			31		nC

Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. L = 0.5 mH, IAS = 28 A, V_{DD} = 10V, R_G = 25 Ω, Starting T_j = 25°C
3. I_{SD} ≤ 40A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_j =25°C
4. Pulse Test : Pulse width ≤ 300us, Duty cycle ≤ 2%
5. Essentially independent of operating temperature

Typical Electronic and Thermal Characteristics

Table 7 Reverse diode characteristics

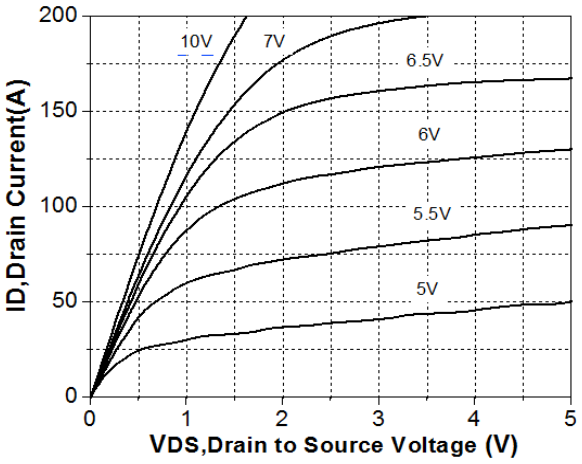


Figure 1. On-Region Characteristics

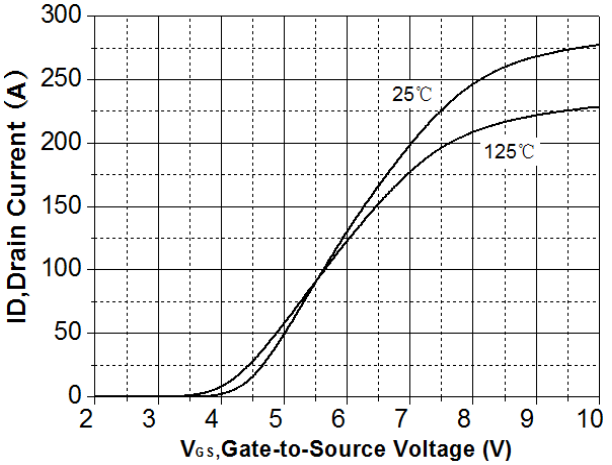


Figure 2. Transfer Characteristics

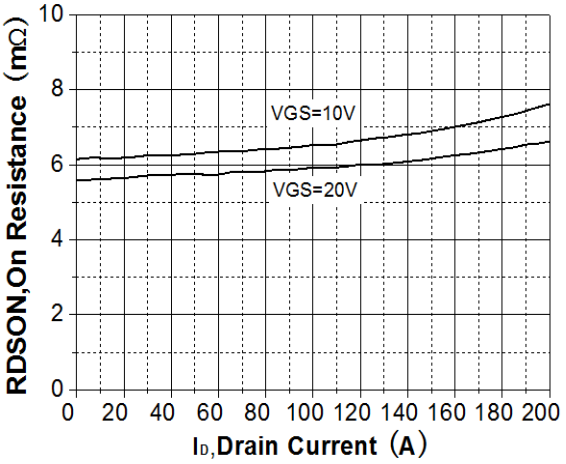


Figure 3. On-Resistance Variation vs Drain Current

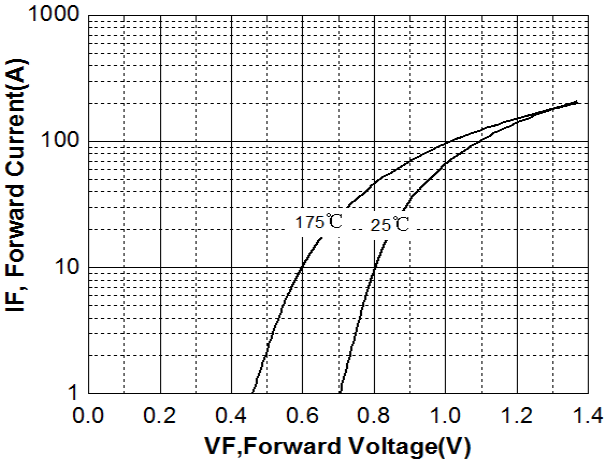


Figure 4. Body Diode Forward Voltage Vs Reverse Drain Current

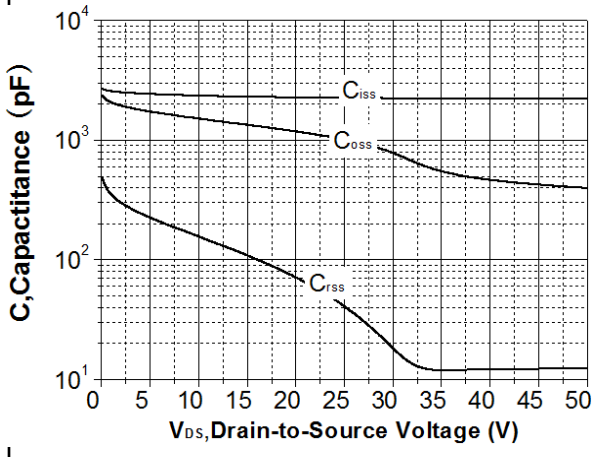


Figure 5. Capacitance Characteristics

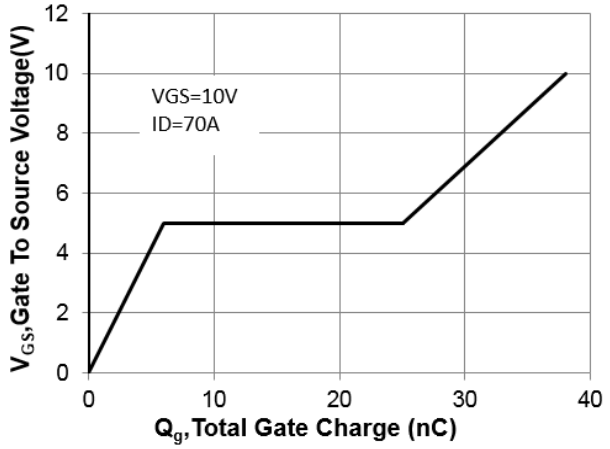


Figure 6. Gate Charge Characteristics

Typical Electronic and Thermal Characteristics

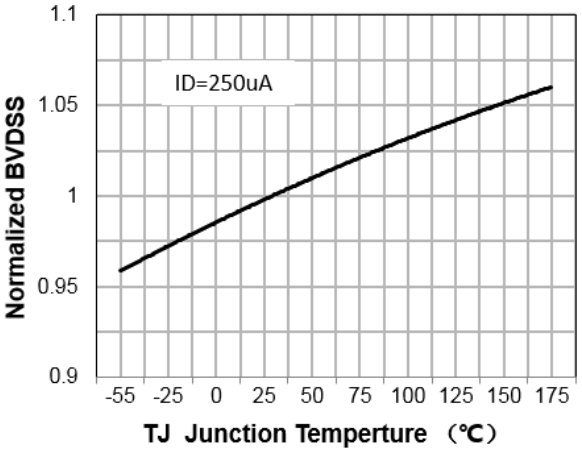


Figure 7. Breakdown Voltage Variation vs Temperature

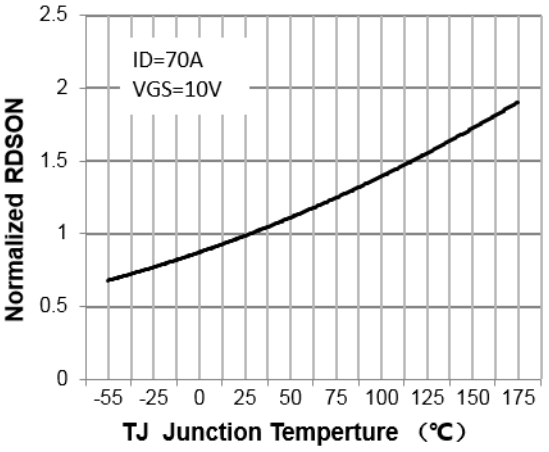


Figure 8. On-Resistance Variation vs Temperature

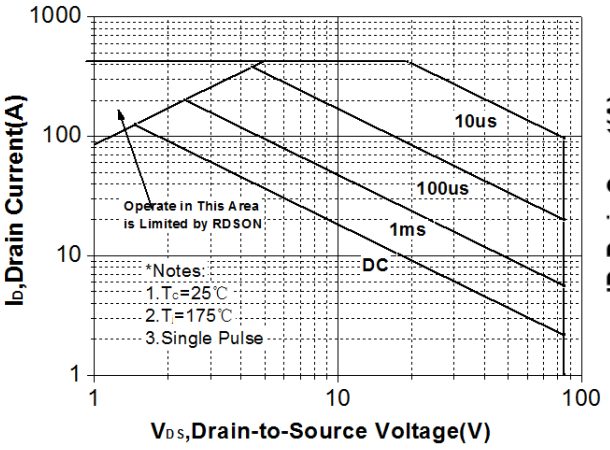


Figure 9. Maximum Safe Operating Area

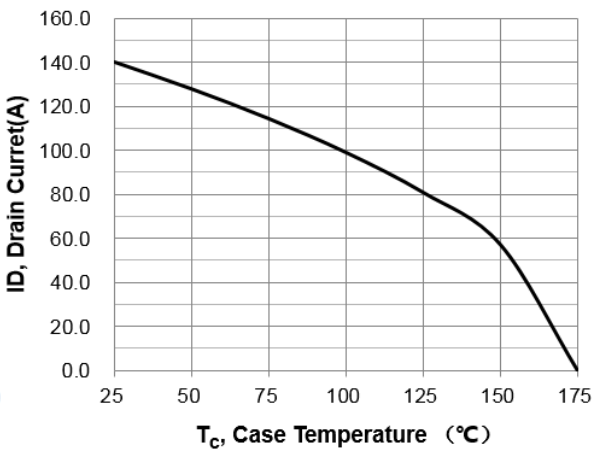


Figure 10. Maximum Drain Current vs Case Temperature

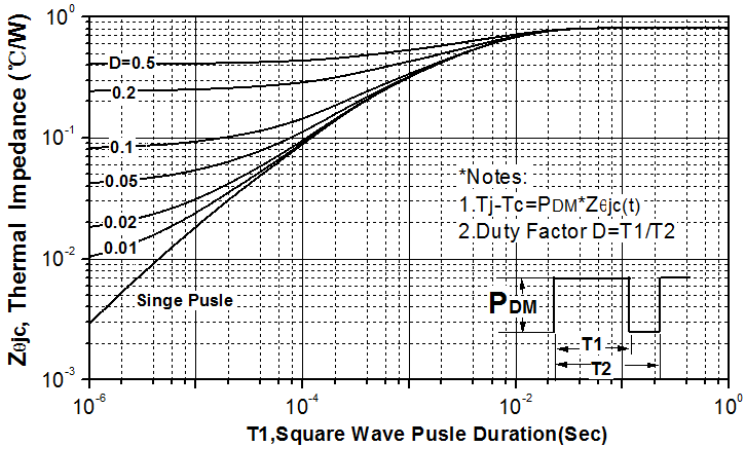
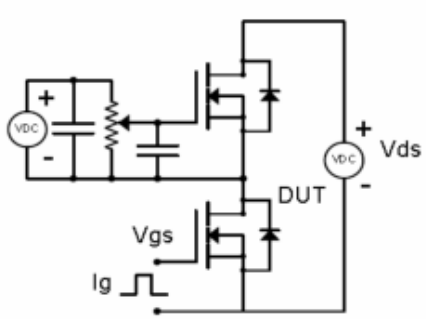
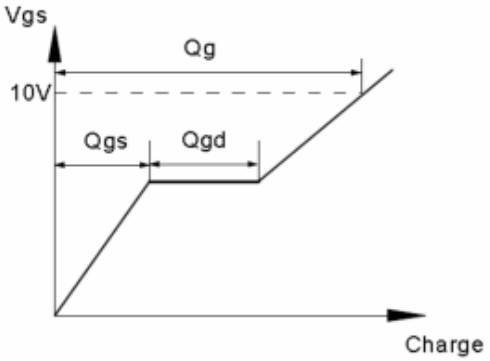


Figure 11. Transient Thermal Response Curve

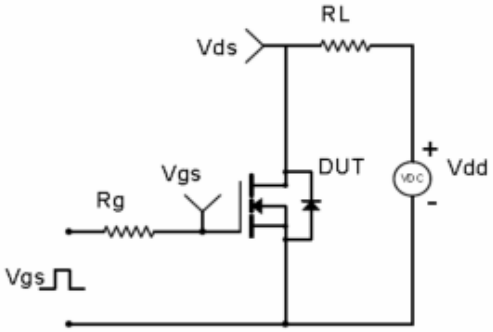
Test Circuit & Waveform

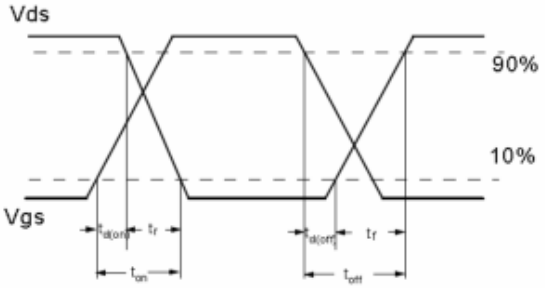
Gate Charge Test Circuit & Waveform



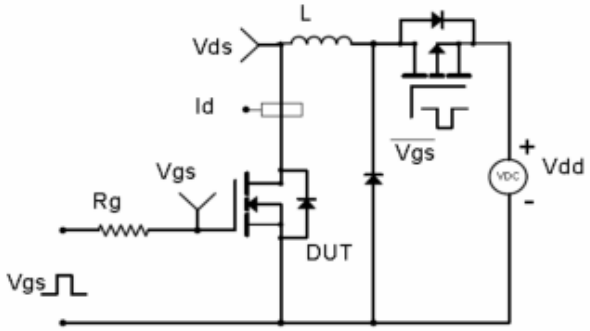


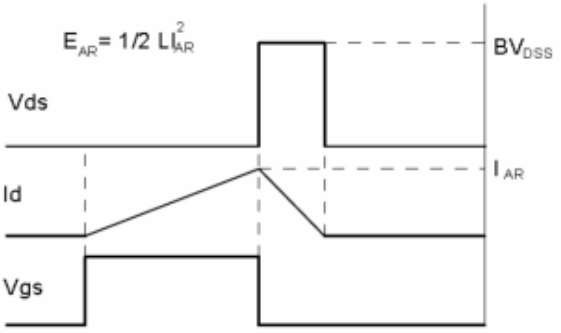
Resistive Switching Test Circuit & Waveforms



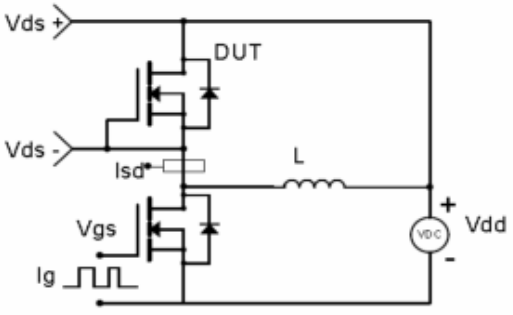


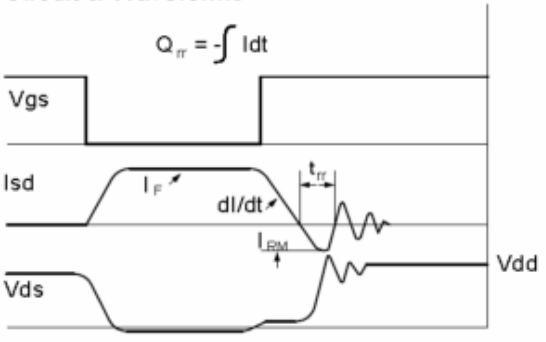
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



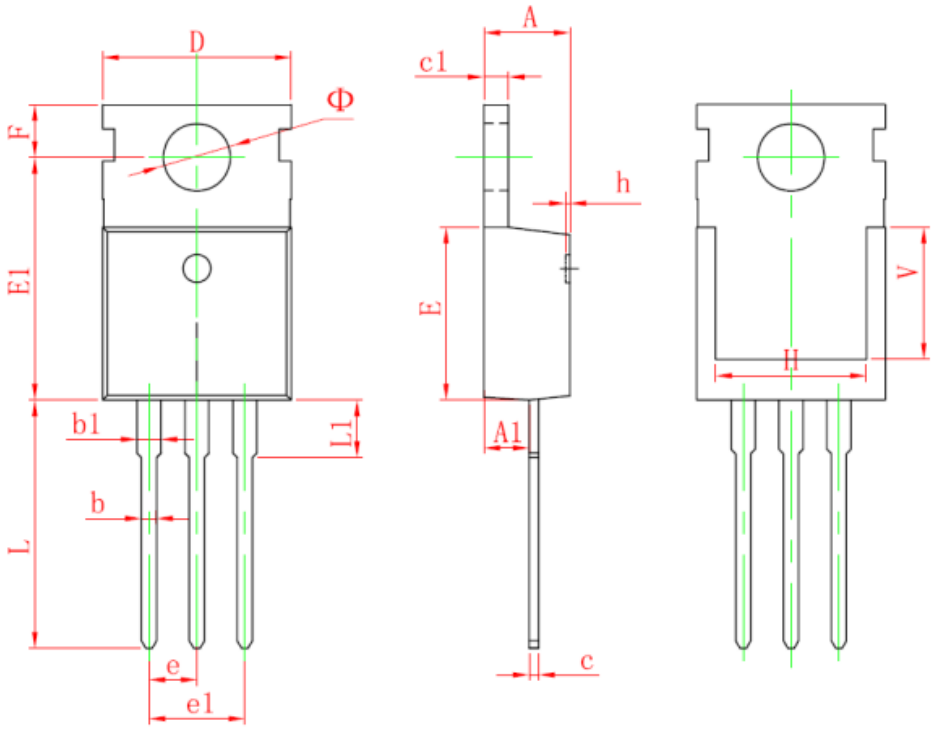


Diode Recovery Test Circuit & Waveforms





Package Dimensions ： TO-220-3L(T0.5mm) PACKAGE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	13.050	0.498	0.514
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150