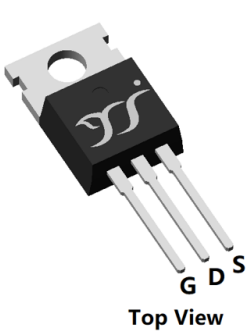
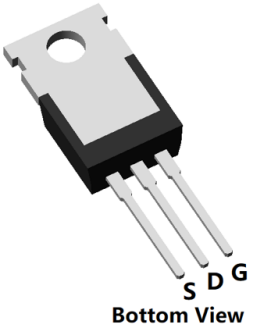
N-Channel Enhancement Mode Field Effect Transistor

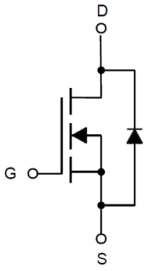


Top View



Bottom View

TO-220



Product Summary

- V_{DS} 60V
- I_D 200A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜2.9 mohm
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜3.6 mohm
- 100% EAS Tested
- 100% ▽V_{DS} Tested

General Description

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- Consumer electronic power supply
- Isolated DC-DC Converters
- Motor control
- Invertors

■ Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	60	V
Gate-source Voltage		V_{GS}	±20	V
Drain Current [A]	T_C=25℃	I_D	200	A
	T_C=100℃		125	
Pulsed Drain Current [B]		I_{DM}	600	A
Avalanche energy [C]		E_{AS}	500	mJ
Total Power Dissipation [D]		P_D	260	W
Thermal Resistance Junction-to-Case		$R_{\theta JC}$	0.48	℃/ W
Thermal Resistance Junction-to-Ambient [E]		$R_{\theta JA}$	28	
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	℃

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJP200G06A	B1	YJP200G06A	50	/	5000	Tube

■ Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA	60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	1.2	1.6	2.2	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=20A		2.35	2.9	mΩ
		V_{GS}= 4.5V, I_D=15A		2.9	3.6	
Diode Forward Voltage	V_{SD}	I_S=20A,V_{GS}=0V			1.2	V
Maximum Body-Diode Continuous Current	I_S				200	A
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V,f=100KHZ		5950		pF
Output Capacitance	C_{oss}			1250		
Reverse Transfer Capacitance	C_{rss}			85		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=50V,I_D=50A		93		nC
Gate-Source Charge	Q_{gs}			17		
Gate-Drain Charge	Q_{gd}			14		
Reverse Recovery Chrage	Q_{rr}	I_F=25A, di/dt=100A/us		73		
Reverse Recovery Time	t_{rr}			68		ns
Turn-on Delay Time	$t_{d(on)}$	V_{GS}=10V,V_{DD}=30V,I_D=25A R_{GEN}=2Ω		22.5		
Turn-on Rise Time	t_r			6.7		
Turn-off Delay Time	$t_{d(off)}$			80.3		
Turn-off fall Time	t_f			26.9		

Note:

A. The maximum current rating is package limited.
B. Repetitive rating; pulse width limited by max. junction temperature.
C. V_{DD}=50 V, R_G=25 Ω, L=0.5mH, starting T_j=25 ℃.
D. P_D is based on max. junction temperature, using junction-case thermal resistance.
E. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with Ta=25 ℃.

■ Typical Performance Characteristics

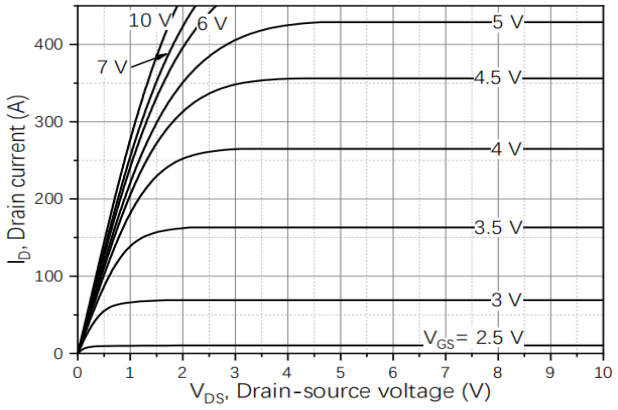


Figure1. Output Characteristics

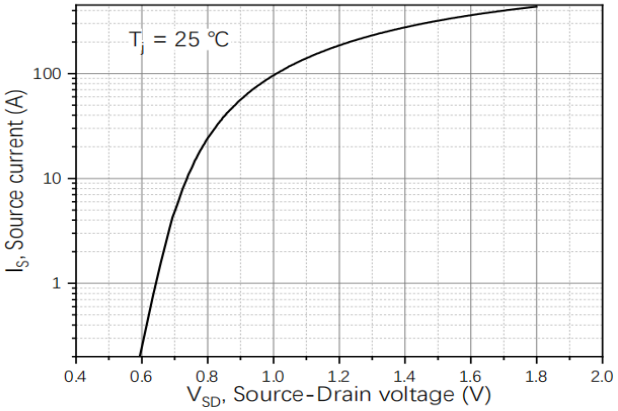


Figure2. Transfer Characteristics

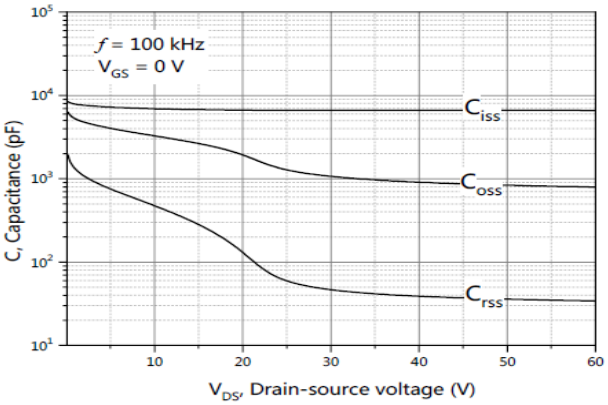


Figure3. Capacitance Characteristics

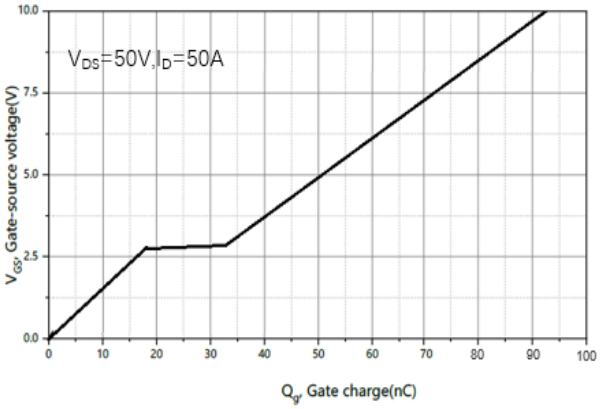


Figure4. Gate Charge

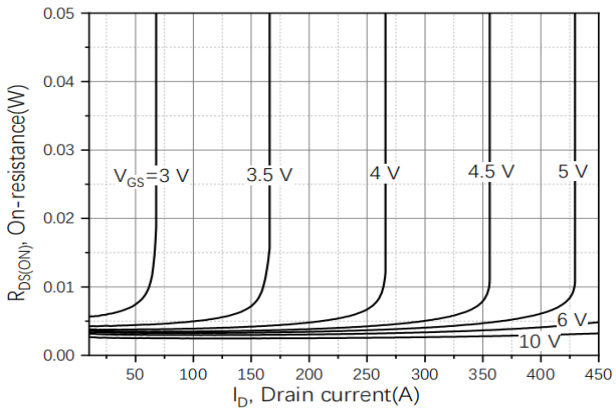


Figure5. Drain-Source on Resistance

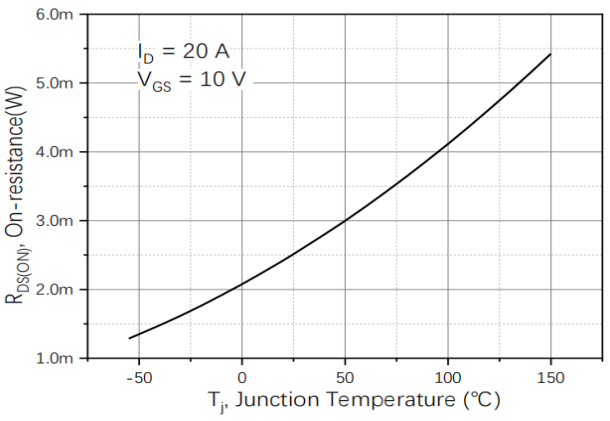


Figure6. Drain-Source on Resistance

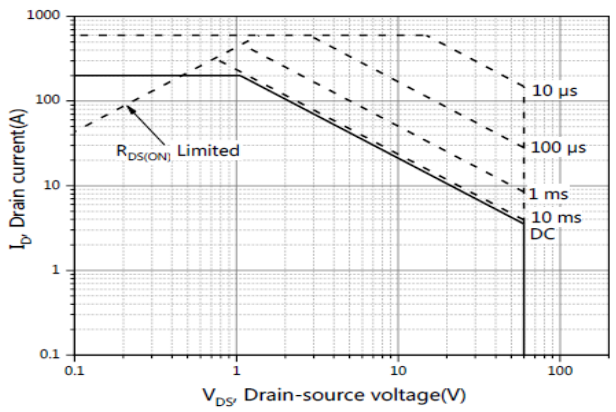


Figure7. Safe Operation Area

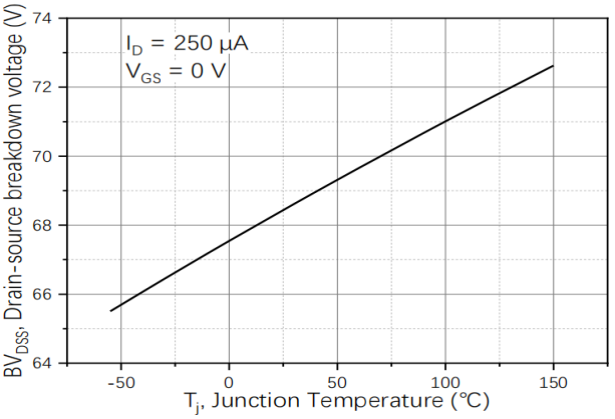


Figure8. Drain-source breakdown voltage

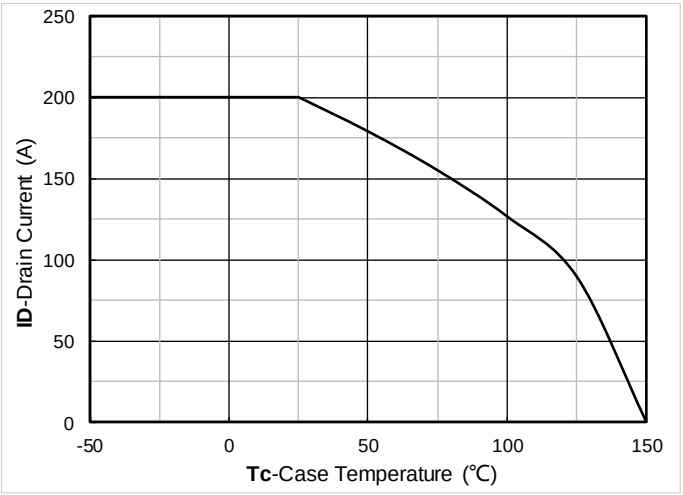


Figure 9. Current dissipation

■ Test circuits and waveforms

Figure A: Gate Charge Test Circuit & Waveforms

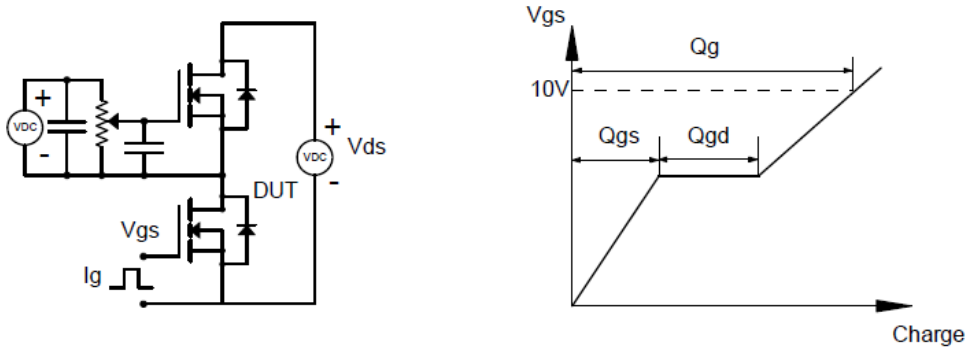


Figure B: Resistive Switching Test Circuit & Waveforms

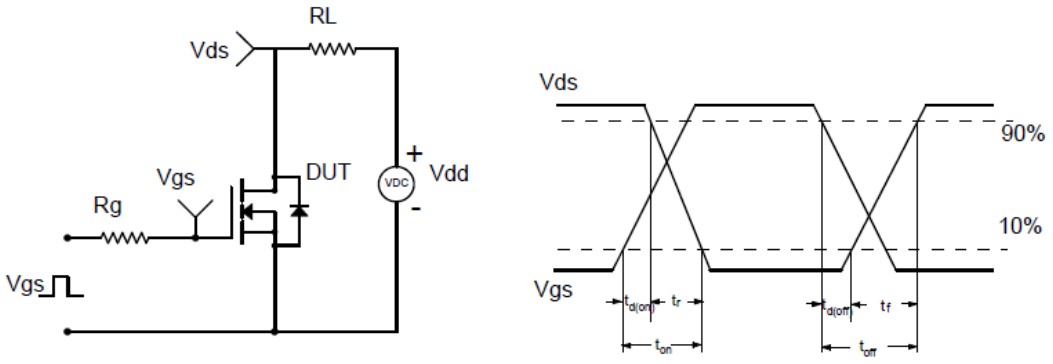


Figure C: Unclamped Inductive Switching (UIS) Test

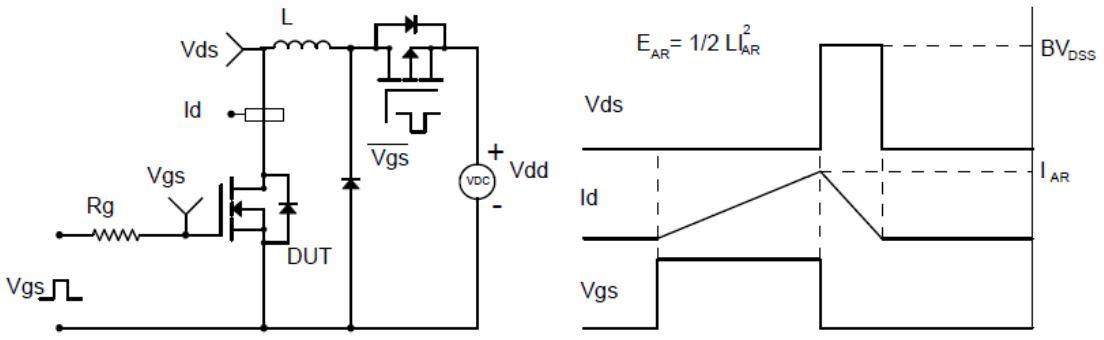
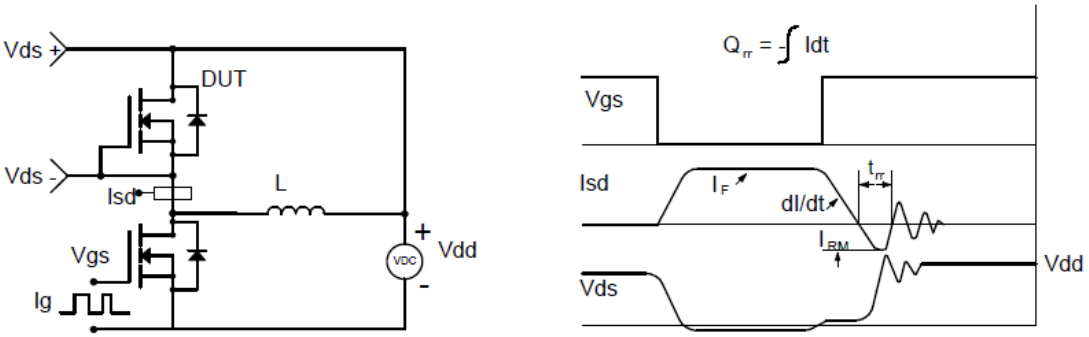
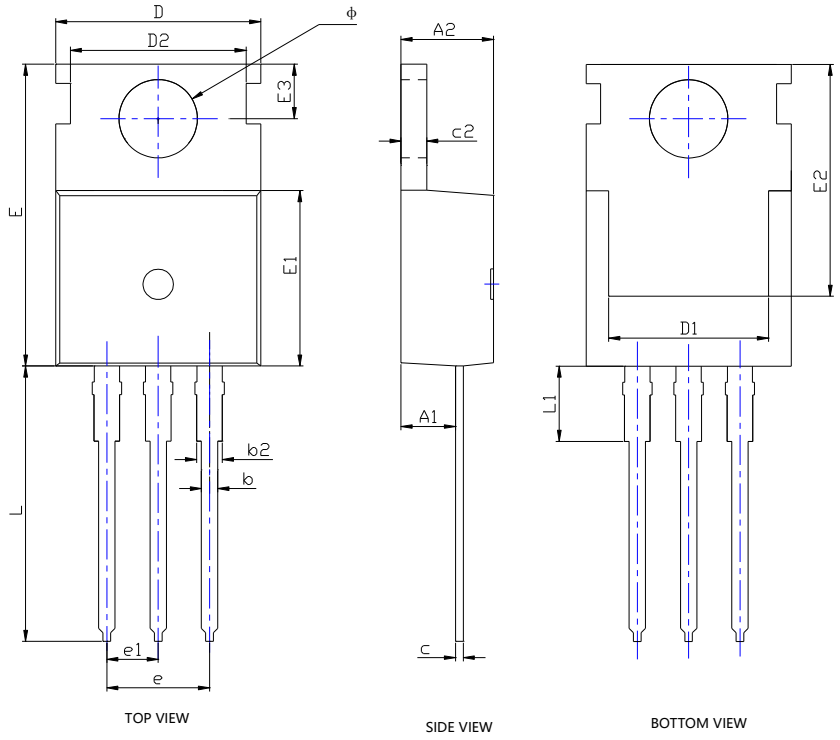


Figure D: Diode Recovery Test Circuit & Waveforms



■ TO-220AB-C Package Information



DIMENSIONS				
SYMBOL	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A1	0.091	0.098	2.300	2.500
A2	0.173	0.181	4.400	4.600
b	0.028	0.035	0.700	0.900
b2	0.049	0.056	1.250	1.420
c	0.018	0.022	0.450	0.550
c2	0.049	0.053	1.250	1.350
D	0.382	0.402	9.700	10.200
D1	0.295	0.331	7.500	8.400
D2	0.335	0.350	8.500	8.900
E	0.602	0.634	15.300	16.100
E1	0.358	0.366	9.100	9.300
E2	0.497	0.525	12.630	13.330
E3	0.108BSC		2.750BSC	
e	0.200BSC		5.080BSC	
e1	0.100BSC		2.540BSC	
L	0.512	0.531	13.000	13.500
L1	---	0.138	---	3.500
ø	0.140	0.148	3.550	3.750

NOTE:
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.

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