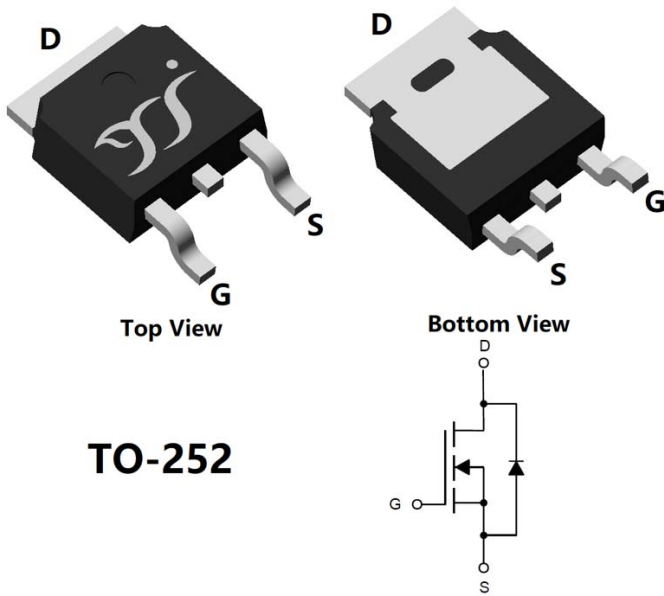


N-Channel Enhancement Mode Field Effect Transistor



Product Summary

- V_{DS} 60V
- I_D 20A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) <43mohm
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) <47mohm
- 100% EAS Tested
- 100% ∇V_{DS} Tested
- ESD Level(HBM) Class 1B

General Description

- Trench Power MV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- DC-DC Converters
- Power management functions
- Backlighting

■ Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	60	V
Gate-source Voltage		V_{GS}	± 20	V
Drain Current	$T_A=25^\circ\text{C}$	I_D	4	A
	$T_A=100^\circ\text{C}$		2.5	
	$T_C=25^\circ\text{C}$		20	
	$T_C=100^\circ\text{C}$		12	
Pulsed Drain Current ^A		I_{DM}	60	A
Total Power Dissipation ^B	$T_A=25^\circ\text{C}$	P_D	1.5	W
	$T_A=100^\circ\text{C}$		0.6	
	$T_C=25^\circ\text{C}$		28	
	$T_C=100^\circ\text{C}$		11	
Single Pulse Avalanche Energy ^C		E_{AS}	30	mJ
Thermal Resistance Junction-to-Ambient ^D	Steady-State	$R_{\theta JA}$	80	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	4.4	
Junction and Storage Temperature Range		T_J, T_{STG}	-55~+150	$^\circ\text{C}$

■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJD20N06A	F1/F2	YJD20N06A	2500	/	25000	13" reel



YJD20N06A

■ 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	T _J =25℃			1	μA
			T _J =150℃			100	
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		1.0	1.5	2.5	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D =20A			34	43	mΩ
		V _{GS} = 4.5V, I _D =10A			36	47	
Diode Forward Voltage	V _{SD}	I _S =10A, V _{GS} =0V			0.8	1.2	V
Maximum Body-Diode Continuous Current	I _S					20	A
Dynamic Parameters							
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f=1MHZ			1018		pF
Output Capacitance	C _{oss}				70		
Reverse Transfer Capacitance	C _{rss}				62		
Switching Parameters							
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =30V, I _D =10A			26		nC
Gate-Source Charge	Q _{gs}				5.4		
Gate-Drain Charge	Q _{gd}				6.5		
Reverse Recovery Charge	Q _{rr}	I _F =20A, di/dt=500A/us			11.7		ns
Reverse Recovery Time	t _{rr}				23		
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =30V, I _D =2A, R _L =1Ω R _{GEN} =3Ω			10		
Turn-on Rise Time	t _r				20		
Turn-off Delay Time	t _{D(off)}				29		
Turn-off fall Time	t _f				22		

- A. Repetitive rating; pulse width limited by max. junction temperature.
 B. P_d is based on max. junction temperature, using junction-case thermal resistance.
 C. T_J=25℃, V_{DD}=40V, V_G=10V, L=0.5mH, I_{AS}=11A
 D. The value of R_{θJA} is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in the still air environment with T_A=25℃.
 The maximum allowed junction temperature of 150℃. The value in any given application depends on the user's specific board design.

■ Typical Performance Characteristics

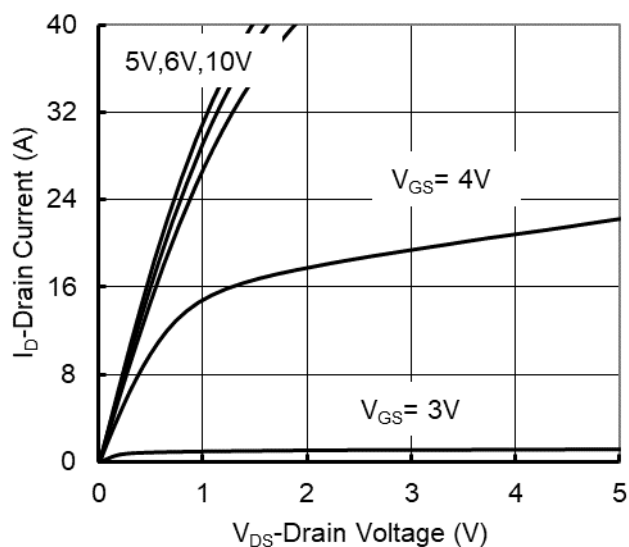


Figure 1. Output Characteristics

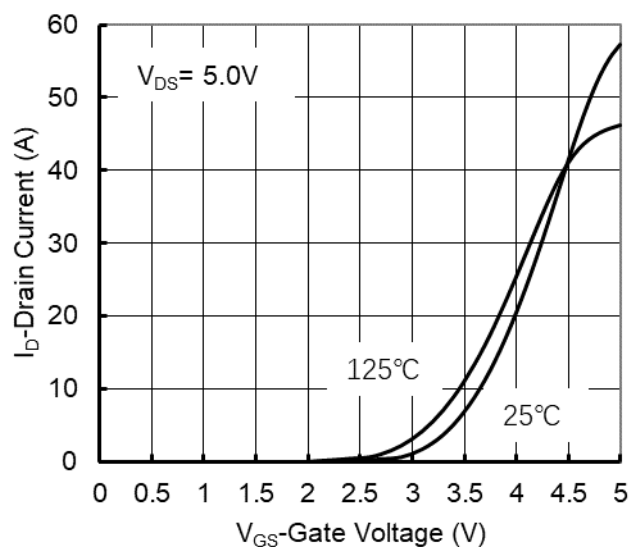


Figure 2. Transfer Characteristics

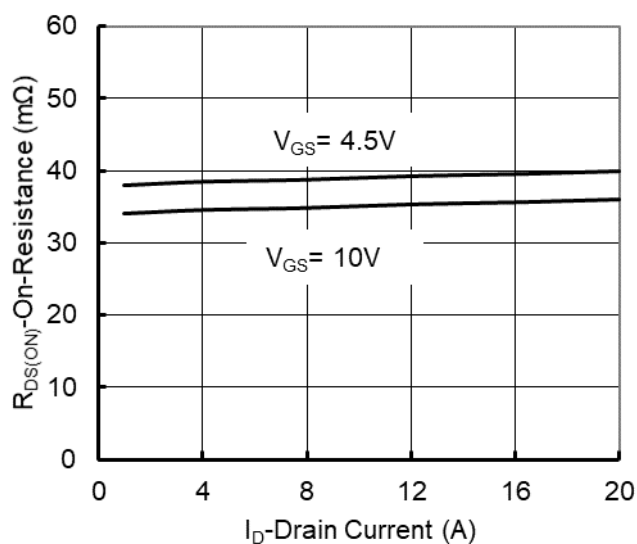


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

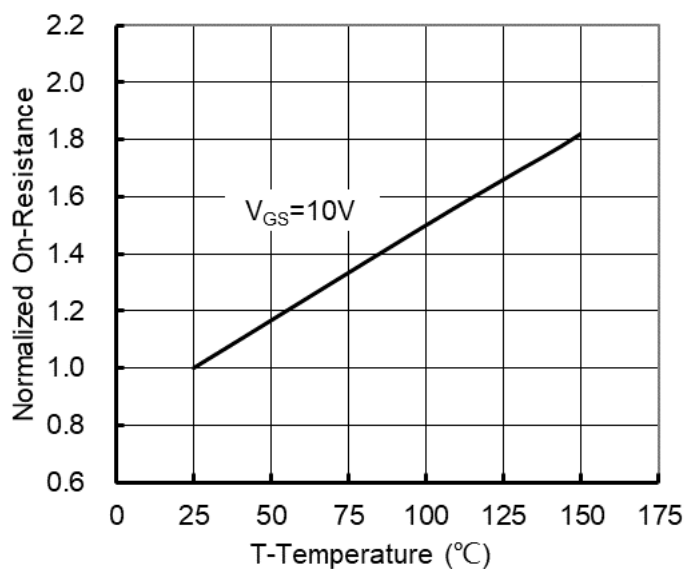


Figure 4. On-Resistance vs. Junction Temperature

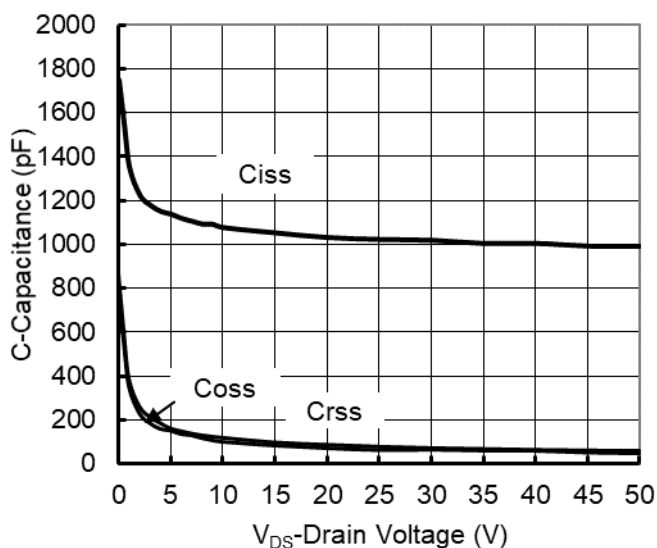


Figure 5. Capacitance Characteristics

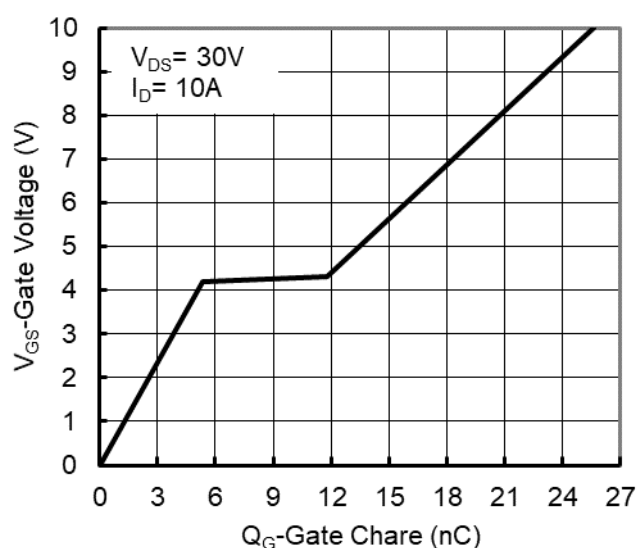


Figure 6. Gate Charge

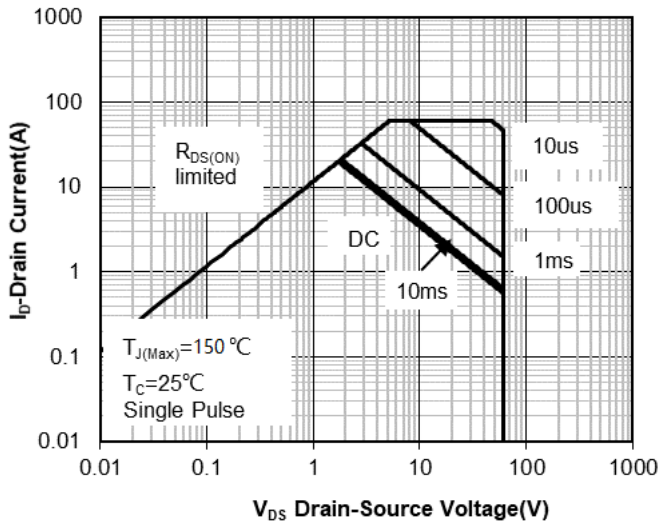


Figure 7. Safe Operation Area

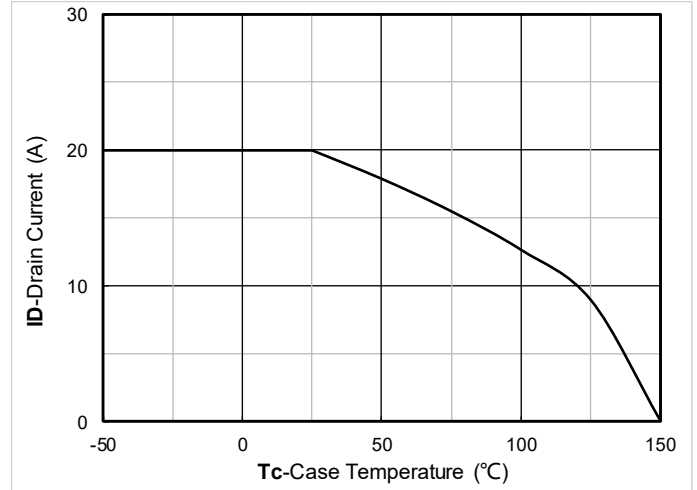


Figure 8. Maximum Continuous Drain Current vs Case Temperature

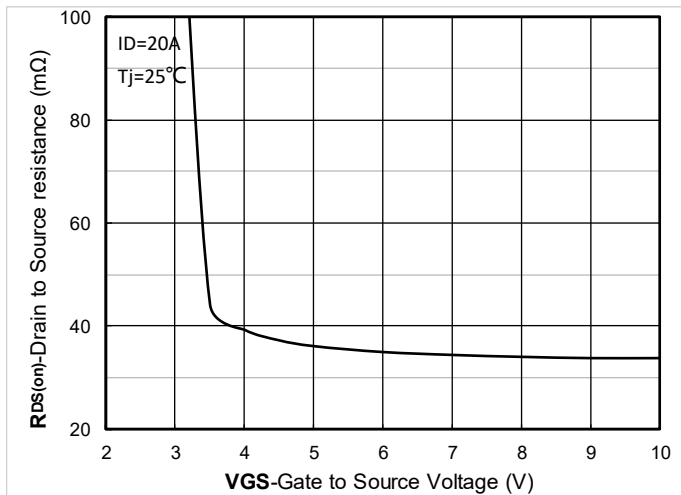


Figure 9. On-Resistance vs Gate to Source Voltage

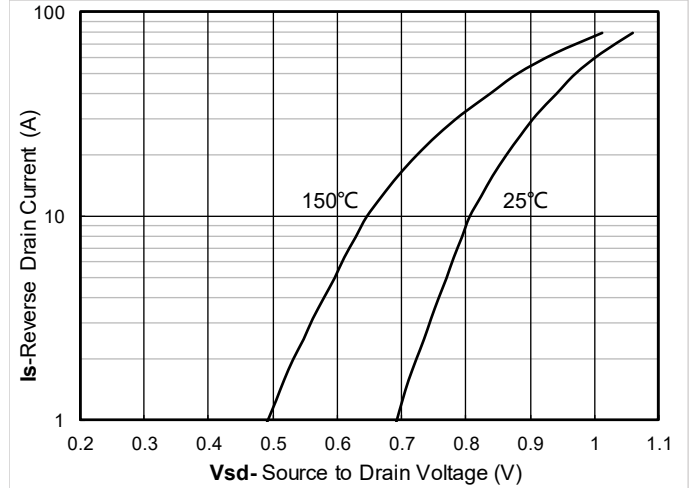


Figure 10. Forward characteristics of reverse diode

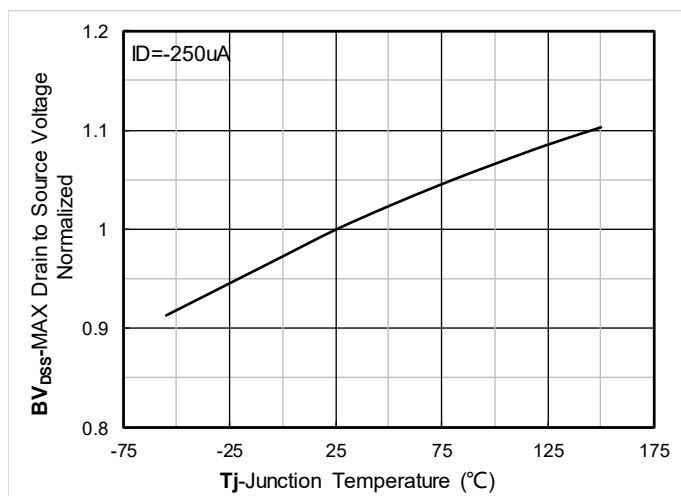


Figure 11. Normalized breakdown voltage

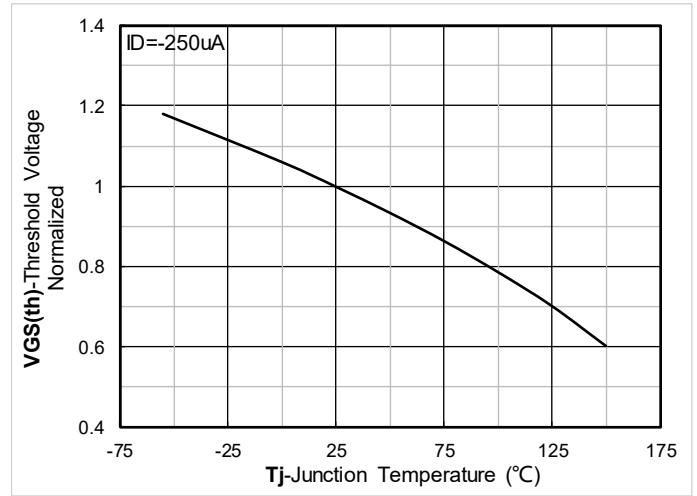


Figure 12. Normalized Threshold voltage

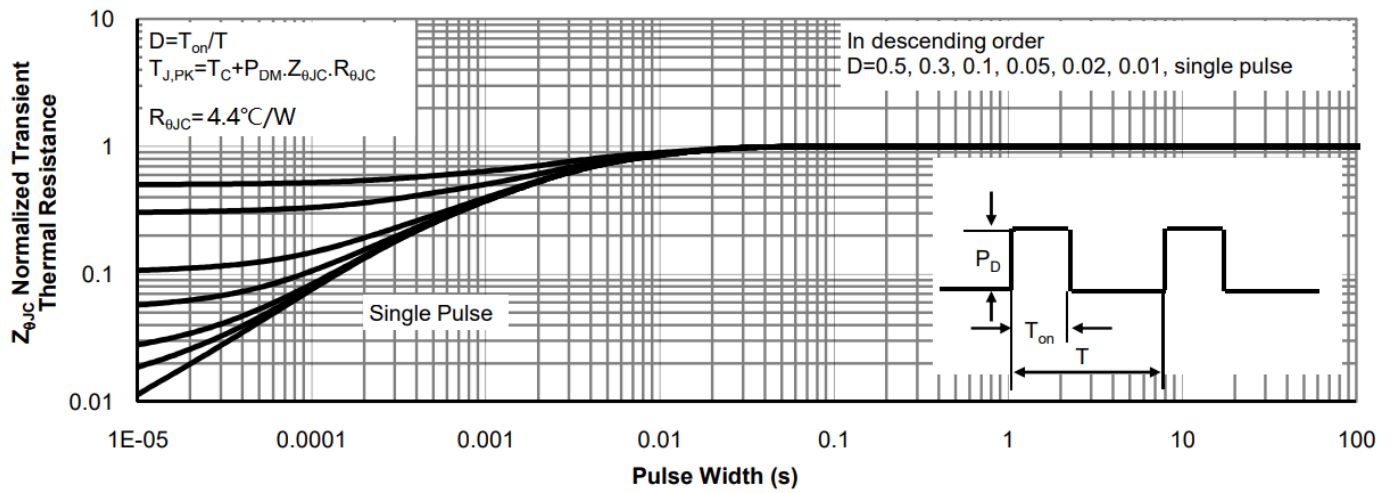
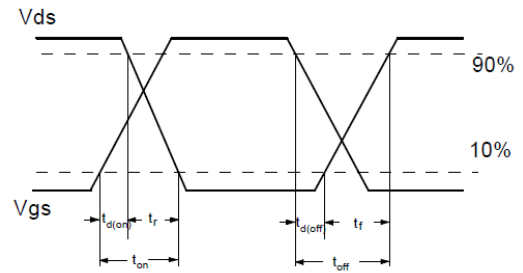
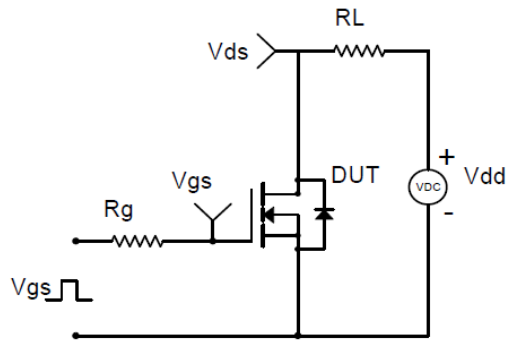
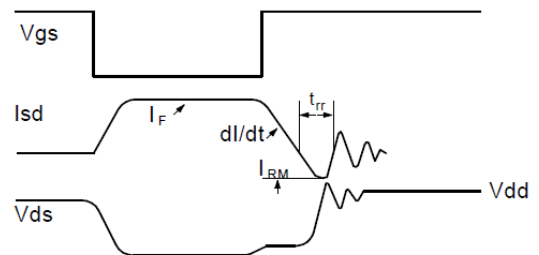
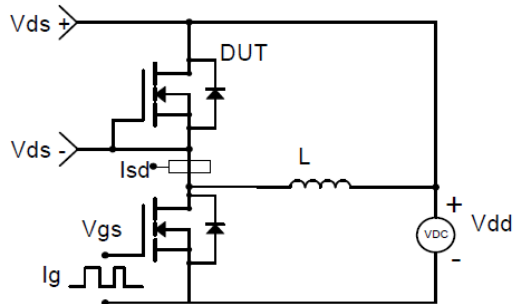


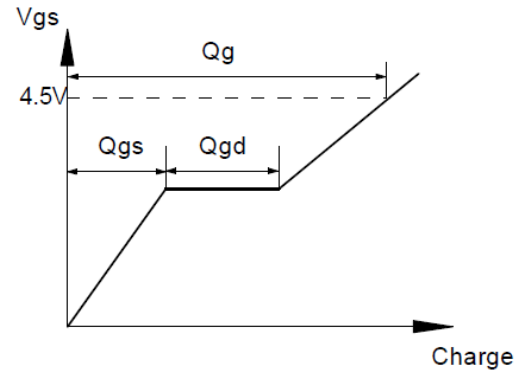
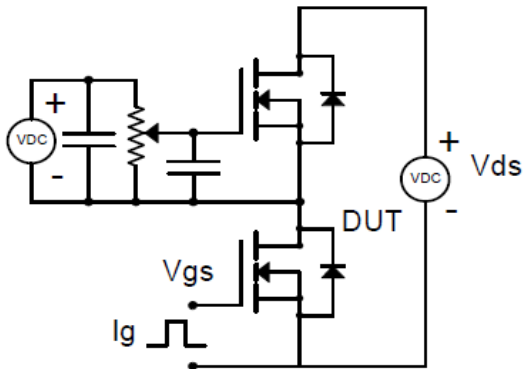
Figure 13. Normalized Maximum Transient Thermal Impedance



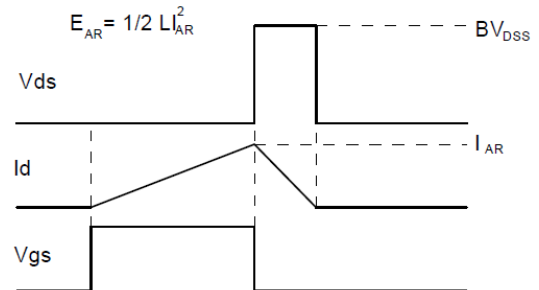
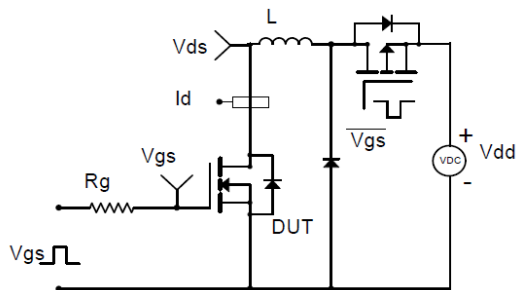
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Gate Charge Test Circuit & Waveform

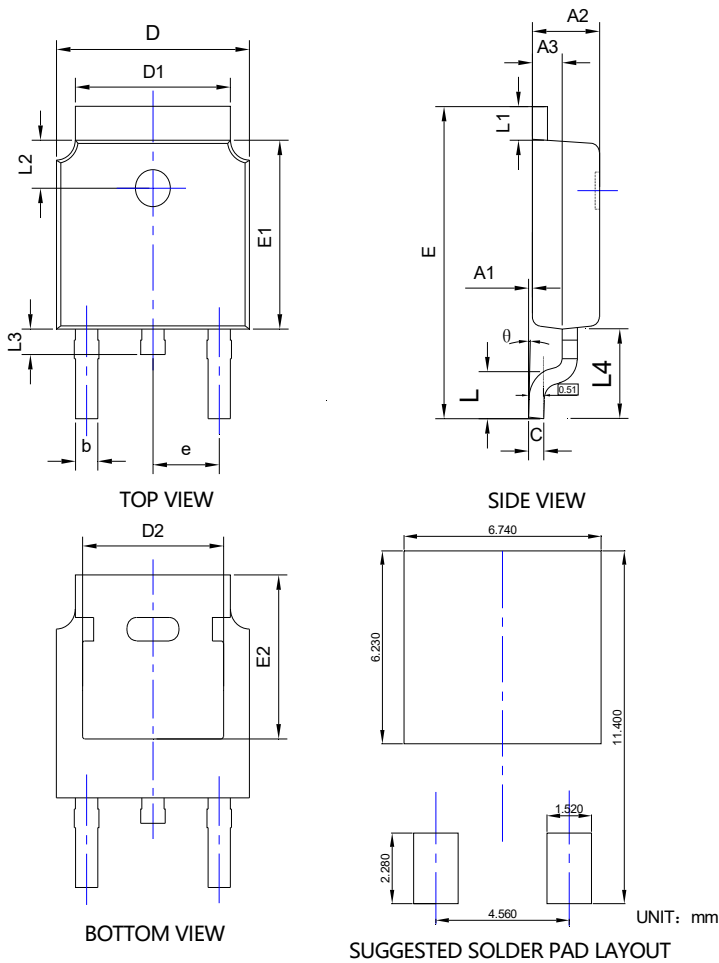


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



YJD20N06A

■ TO-252-B Package information



SYMBOL	DIMENSIONS					
	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A1	0.000	---	0.008	0.000	---	0.200
A2	0.087	0.091	0.094	2.200	2.300	2.400
A3	0.035	0.039	0.043	0.900	1.000	1.100
b	0.026	0.030	0.034	0.660	0.760	0.860
c	0.018	0.020	0.023	0.460	0.520	0.580
D	0.256	0.260	0.264	6.500	6.600	6.700
D1	0.203	0.209	0.215	5.150	5.300	5.450
D2	0.181	0.189	0.195	4.600	4.800	4.950
E	0.390	0.398	0.406	9.900	10.100	10.300
E1	0.236	0.240	0.244	6.000	6.100	6.200
E2	0.203	0.209	0.215	5.150	5.300	5.450
e	0.090BSC			2.286BSC		
L	0.049	0.059	0.069	1.250	1.500	1.750
L1	0.035	---	0.050	0.900	---	1.270
L2	0.055	---	0.075	1.400	---	1.900
L3	0.024	0.031	0.039	0.600	0.800	1.000
L4	0.114REF			2.900REF		
θ	0°	---	10°	0°	---	10°

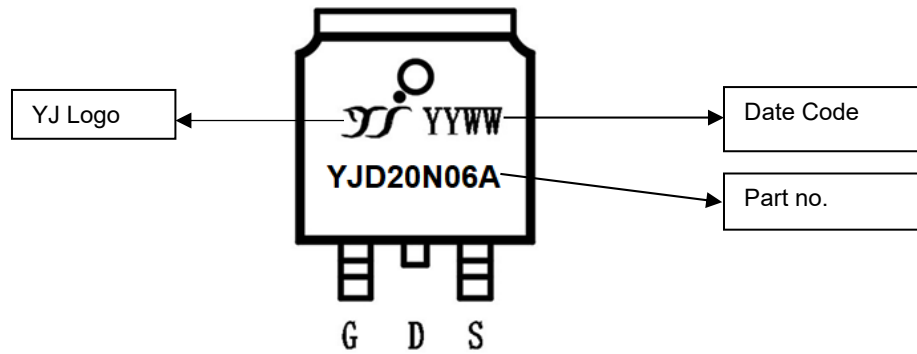
NOTE:

1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2. TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
3. THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.



YJD20N06A

■ Marking Information



Note:

1. All marking is at middle of the product body
2. All marking is in laser printing
3. YJD20N06A is part no., YYWW is date code, "YY" is year, "WW" is week
4. Body color: Black



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