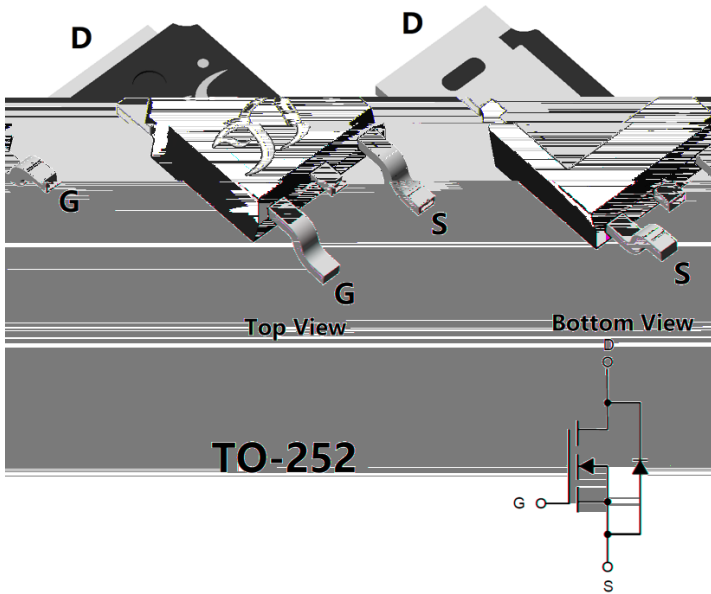


N-Channel Enhancement Mode Field Effect Transistor



Product Summary

P_{DS}	60V
G	20A
$L_{DS(ON)}$ (at $V_{GS}=10V$)	<43mohm
$L_{DS(ON)}$ (at $V_{GS}=4.5V$)	<47mohm
100% EAS Tested	
100% ∇V_{DS} Tested	

General Description

N h b Ji 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
 Balogen Free

Applications

DC-DC Converters
 Power management functions
 Backlighting

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

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

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°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250 ;	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V	T _J =25°C		1	;
			T _J =150°C		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 =250 ;	1.0	1.5	2.5	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D =20A		34	43	m
		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 _r =20A, di/dt=500A/us		11.7		
Reverse Recovery Time	t _{rr}			23		
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =30V, I _D =2A, R _L =1 R _{GEN} =3		10		ns
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_q is based on max. junction temperature, using junction-case thermal resistance.
 C. T_J=25°C, V_{DD}=40V, V_G=10V, L=0.5mH, I_{AS}=11A
 D. The value of R_q is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in the still air environment with T_A =25°C. The maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.



Typical Performance Characteristics

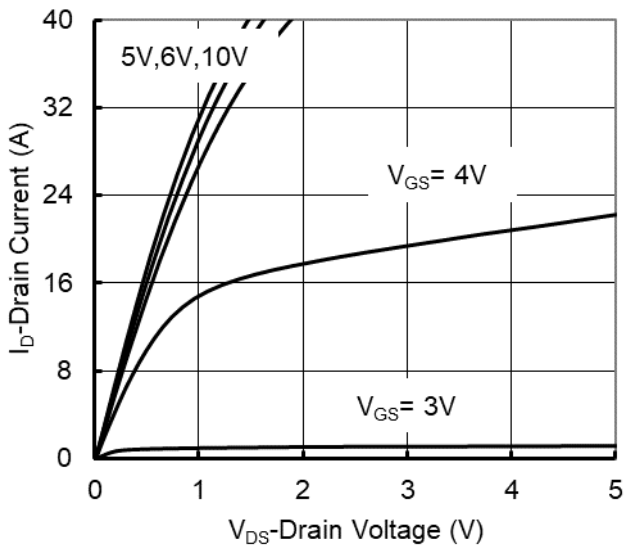


Figure 1. Output Characteristics

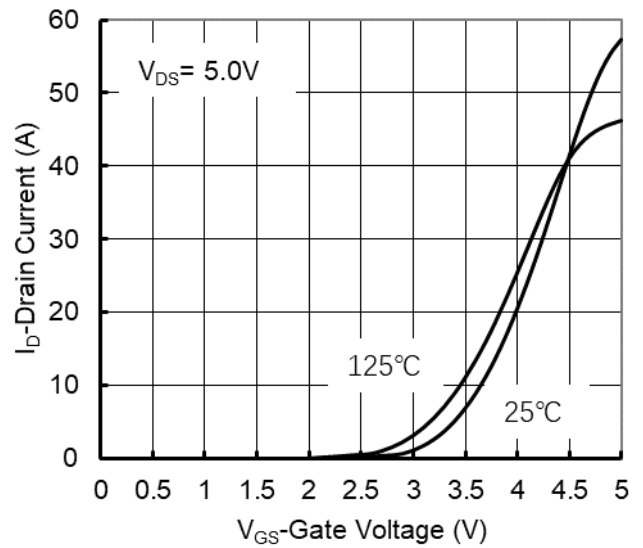


Figure 2. Transfer Characteristics

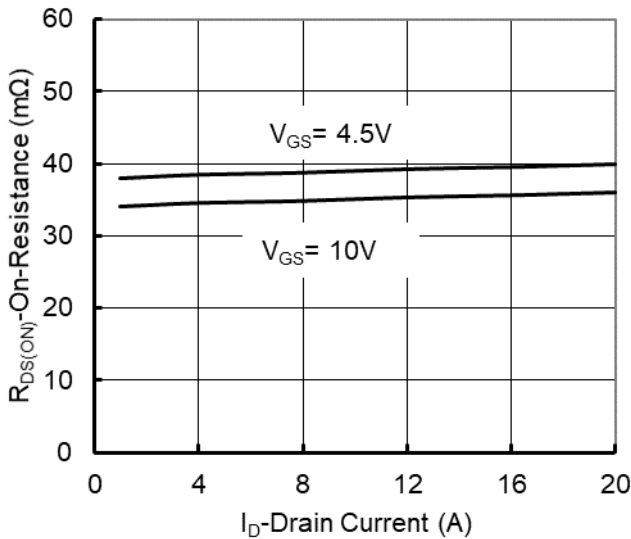


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

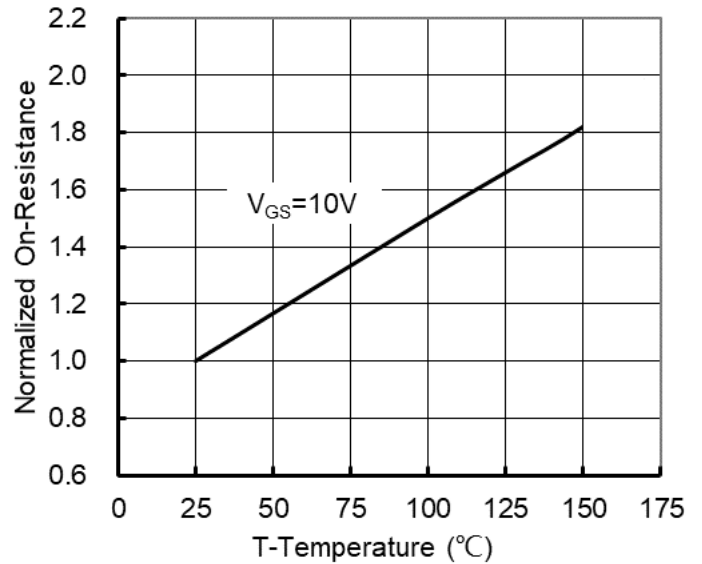


Figure 4. On-Resistance vs. Junction Temperature

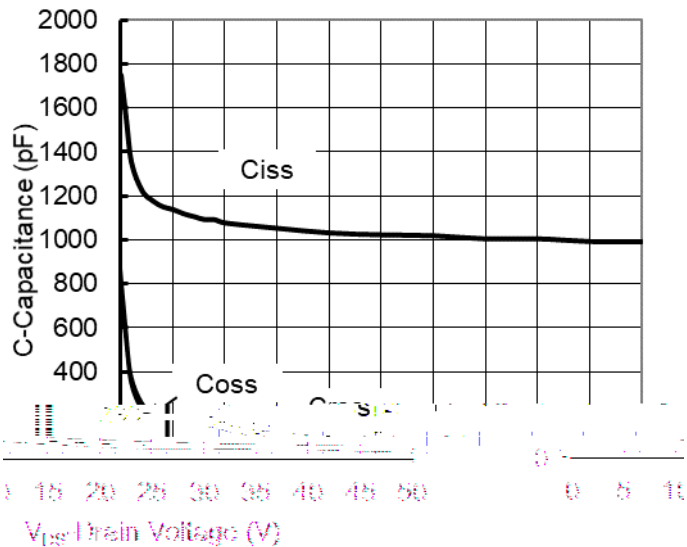


Figure 5. Capacitance Characteristics

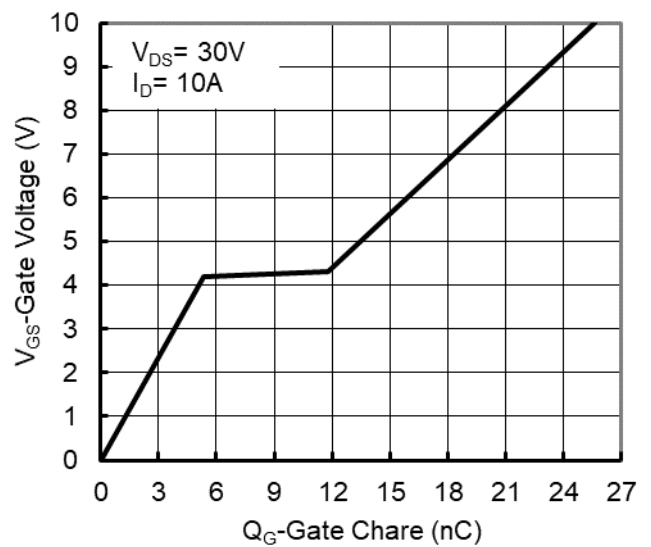


Figure 6. Gate Charge

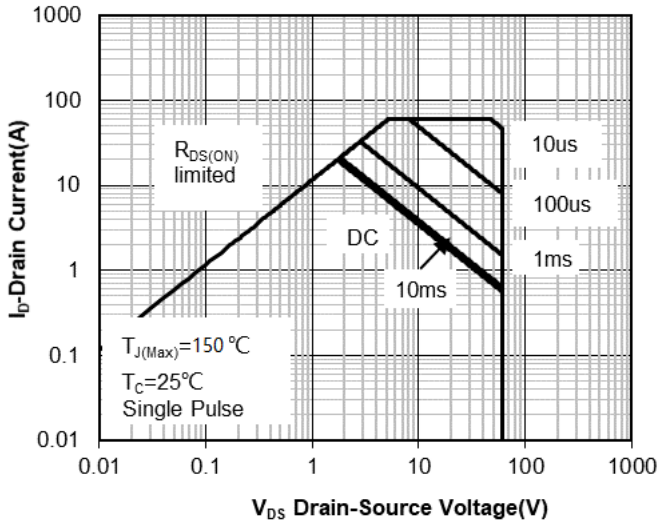


Figure 7. Safe Operation Area

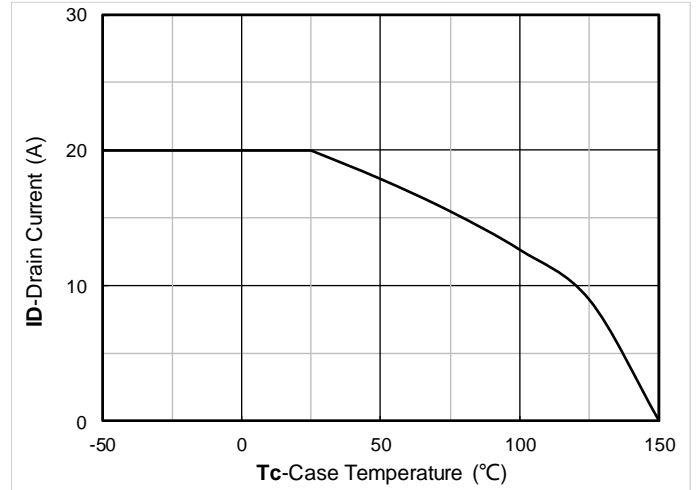


Figure 8. Maximum Continuous Drain Current vs Case Temperature

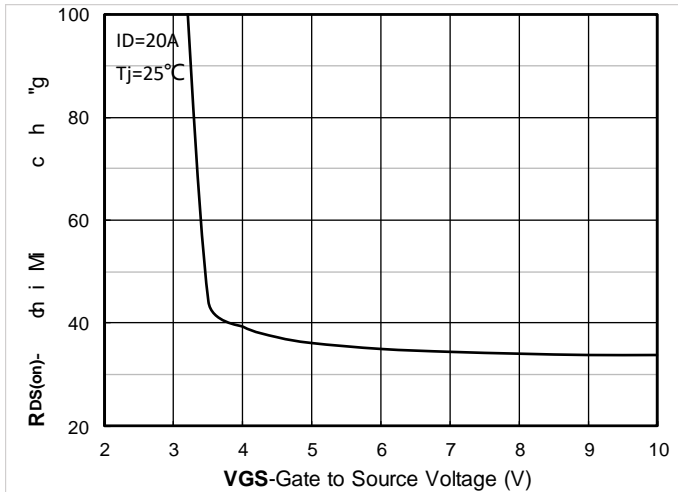


Figure 9. On-Resistance vs Gate to Source Voltage

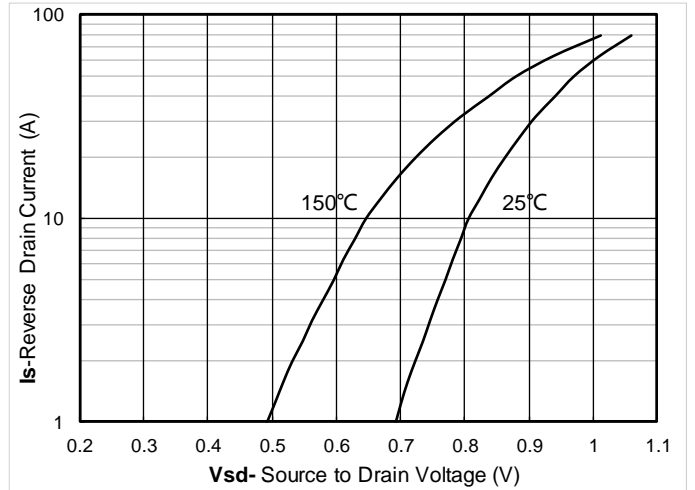


Figure 10. Forward characteristics of reverse diode

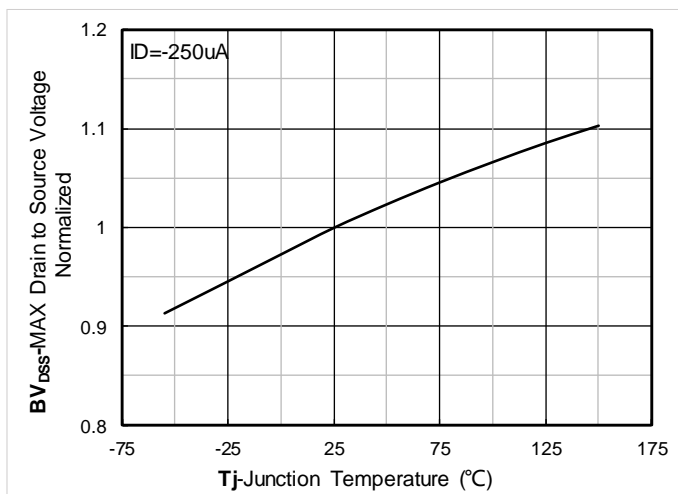


Figure 11. Normalized breakdown voltage

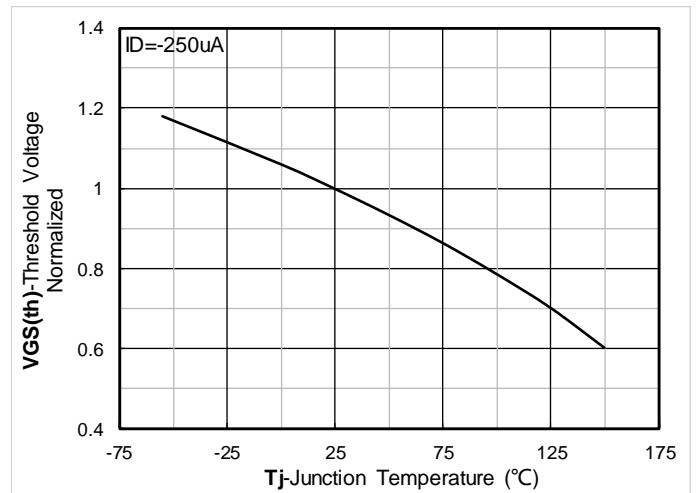


Figure 12. Normalized Threshold voltage



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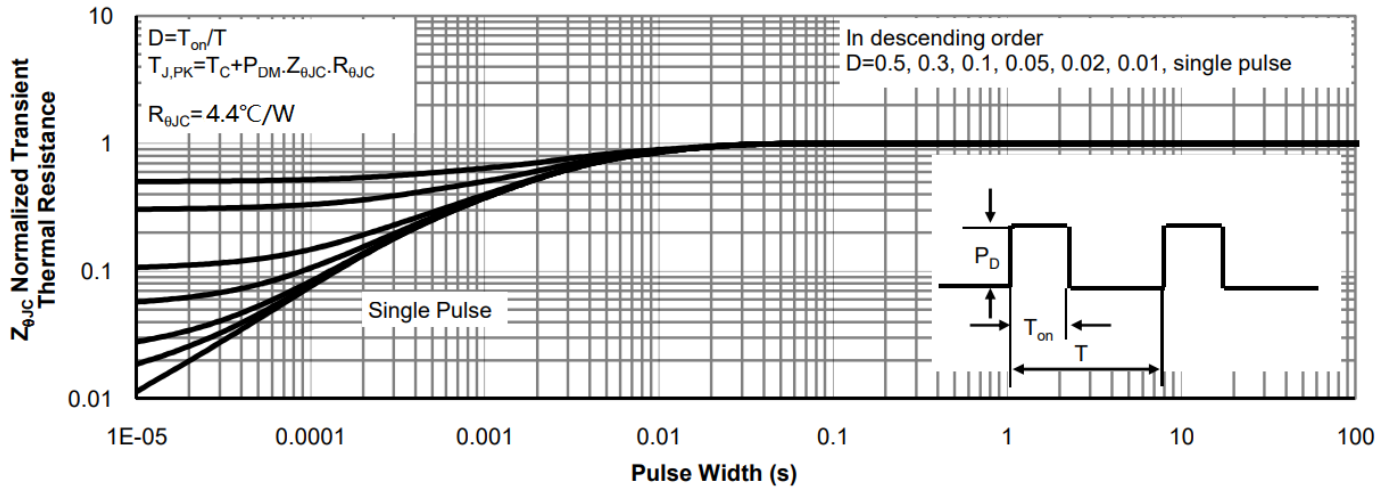
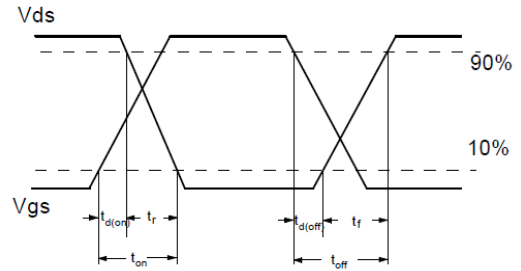
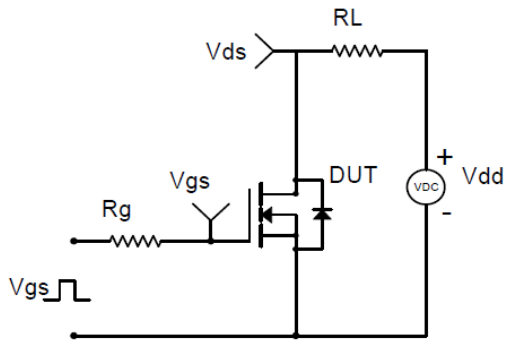
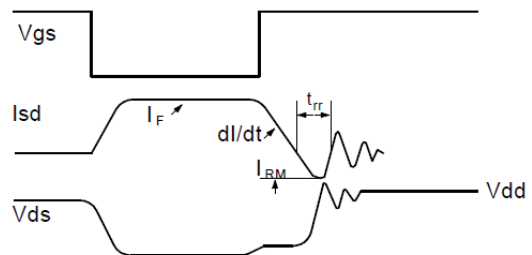
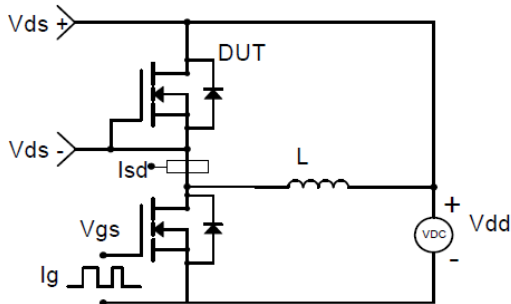


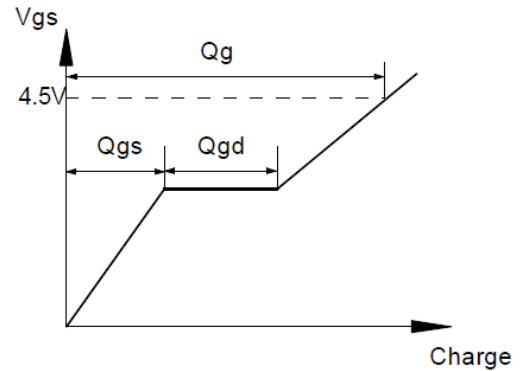
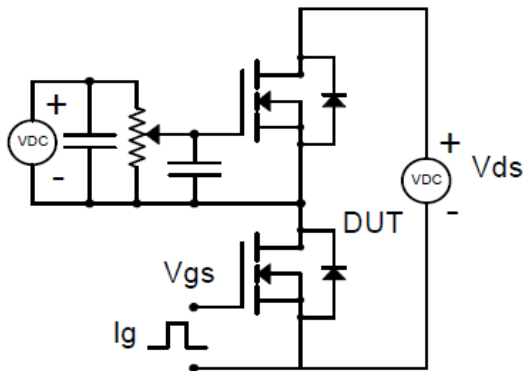
Figure 13. Normalized Maximum Transient Thermal Impedance



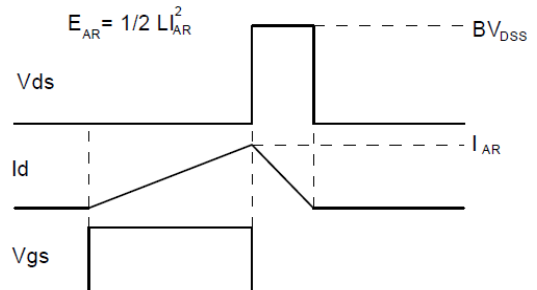
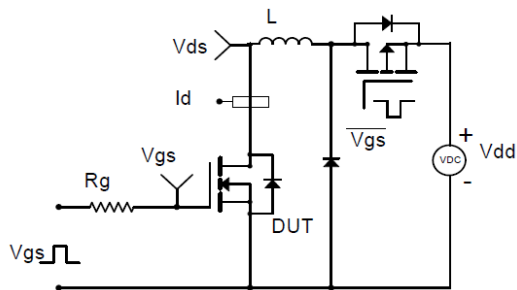
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Gate Charge Test Circuit & Waveform

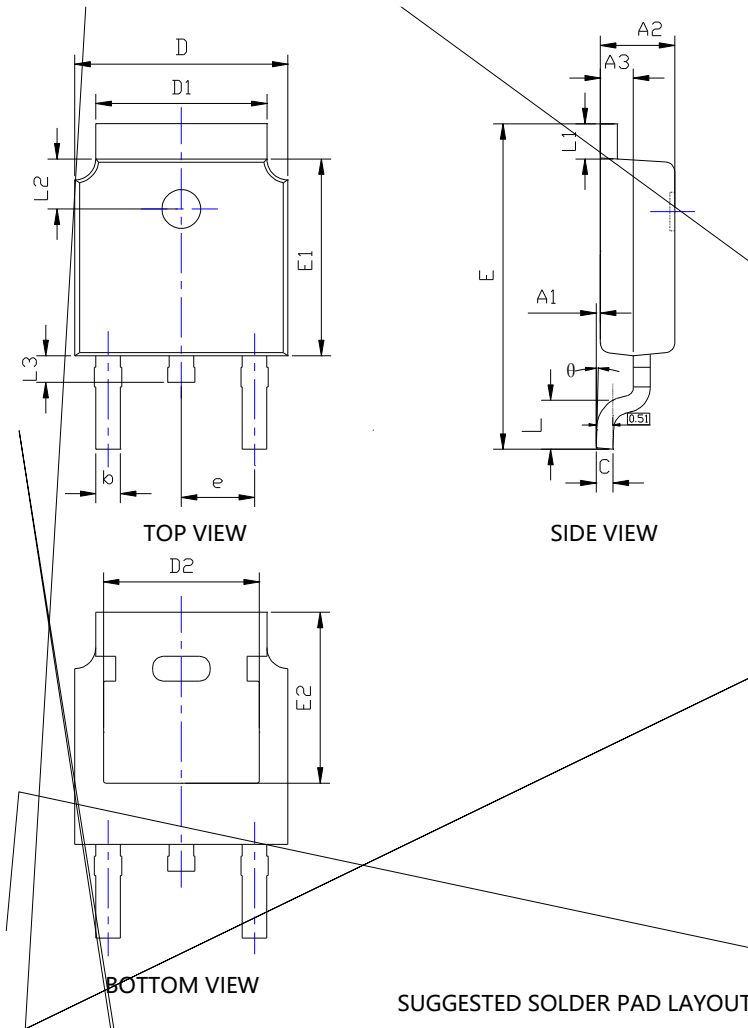


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



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	0.050BSC			2.286BSC		
L	0.049	0.059	0.069	1.250	1.500	1.750
L1	0.03					
L2	0.055		0.075	1.400		1.900
L3	0.240	0.310	0.039	0.600		1.000
L4	0.114REF					
theta	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.



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