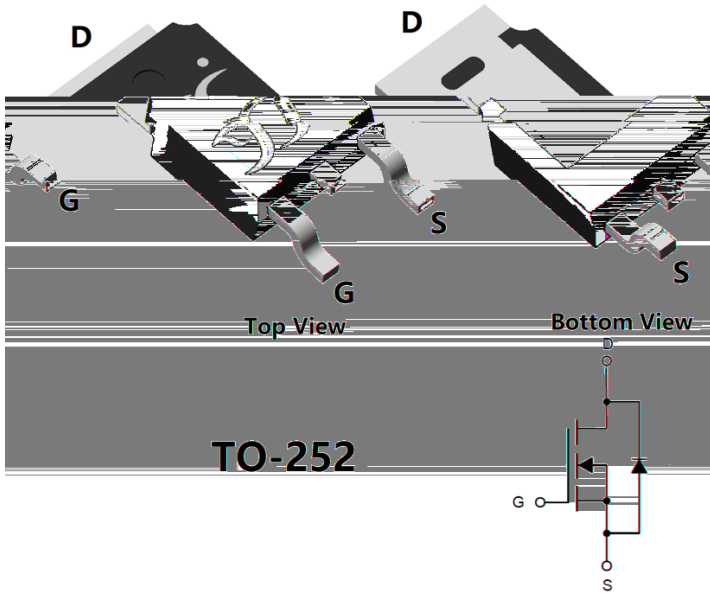


N-Channel Enhancement Mode Field Effect Transistor



Product Summary

- V_{DS} 60 V
- I_D 90 A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) <7.2 mohm
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) <8.5 mohm
- 100% EAS Tested
- 100% ∇V_{DS} Tested

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
- Motor Drive applications

■ 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	$T_C=25^\circ C$	I_D	90	A
	$T_C=100^\circ C$		57	
Pulsed Drain Current ^A		I_{DM}	300	A
Total Power Dissipation @ $T_C=25^\circ C$ ^B		P_D	110	W
Total Power Dissipation @ $T_C=100^\circ C$ ^B		P_D	44	W
Total Power Dissipation @ $T_A=25^\circ C$ ^C		P_D	6.2	W
Single Pulse Avalanche Energy ^D		E_{AS}	196	mJ
Thermal Resistance Junction-to-Case		$R_{\theta JC}$	1.14	$^\circ C/W$
Thermal Resistance Junction-to-Ambient		$R_{\theta JA}$	20	$^\circ C/W$
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
YJD90N06A	F1/F2	YJD90N06A	2500	/	25000	13" reel



YJD90N06A

■ 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 =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	1.0	1.5	2.5	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D =45A		5.8	7.2	mΩ
		V _{GS} = 10V, I _D =15A		5.6	7.2	
		V _{GS} = 4.5V, I _D =10A		6.8	8.5	
Diode Forward Voltage	V _{SD}	I _S =45A, V _{GS} =0V		0.90	1.2	V
Maximum Body-Diode Continuous Current	I _S				90	A
Gate resistance	R _g	f=1 MHz, Open drain		2.1		Ω
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f=1MHZ		5170		pF
Output Capacitance	C _{oss}			300		
Reverse Transfer Capacitance	C _{rss}			155		
Switching Parameters						
Total Gate Charge	Q _g (10V)	V _{GS} =10V, V _{DS} =30V, I _D =20A		102		nC
Total Gate Charge	Q _g (4.5V)			48		
Gate-Source Charge	Q _{gs}			18.7		
Gate-Drain Charge	Q _{gd}			20		
Reverse Recovery Charge	Q _{rr}	I _F =20A, di/dt=100A/us		18		
Reverse Recovery Time	t _{rr}			27		
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =30V, I _D =20A R _{GEN} =3Ω		12		ns
Turn-on Rise Time	t _r			46		
Turn-off Delay Time	t _{D(off)}			90		
Turn-off fall Time	t _f			80		

A. Pulse Test: Pulse Width ≤ 300us, Duty cycle ≤ 2%.

B. The power dissipation P_D is based on T_{J(MAX)}=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C. The value of R_{θJA} is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

D. T_J=25°C, V_{DD}=55V, V_G=10V, L=0.5mH.



■ Typical Performance Characteristics

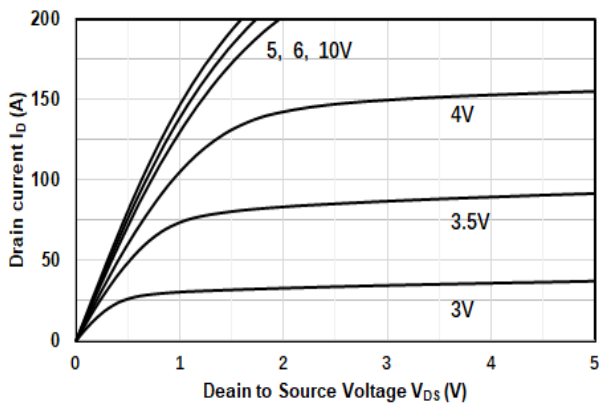


Figure1. Output Characteristics

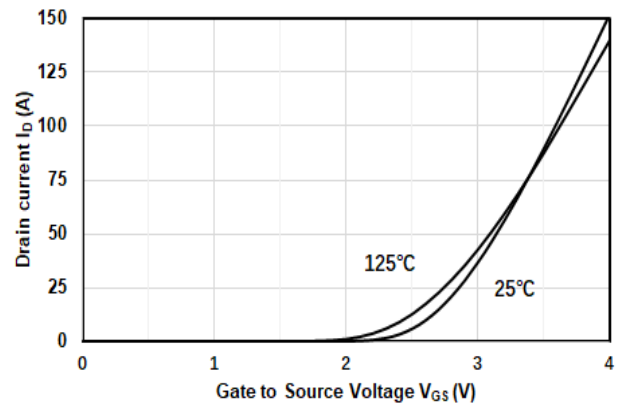


Figure2. Transfer Characteristics

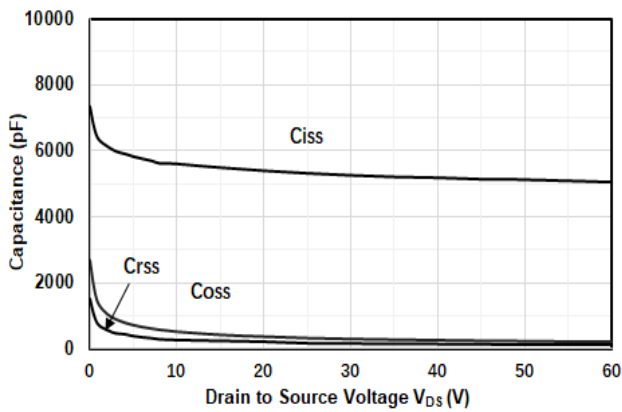


Figure3. Capacitance Characteristics

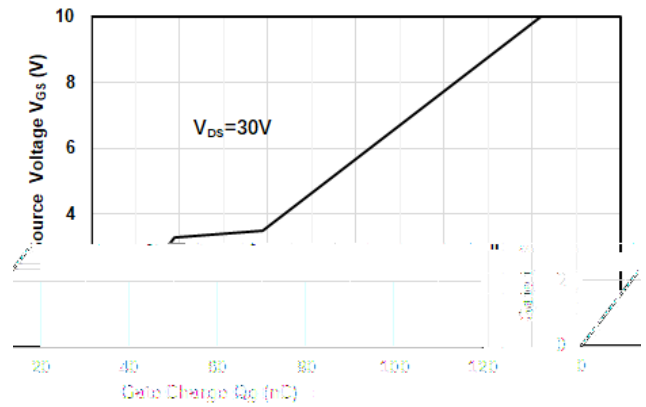


Figure4. Gate Charge

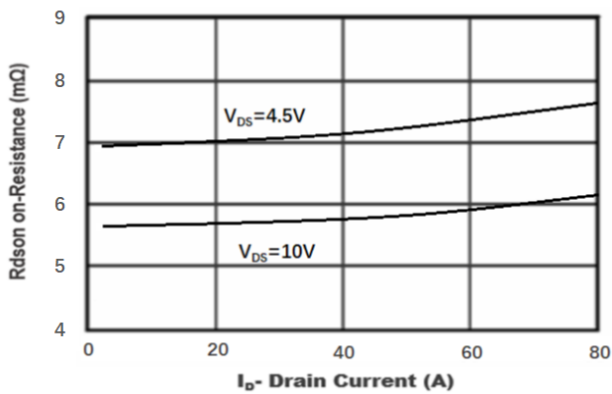


Figure5. Drain-Source on Resistance

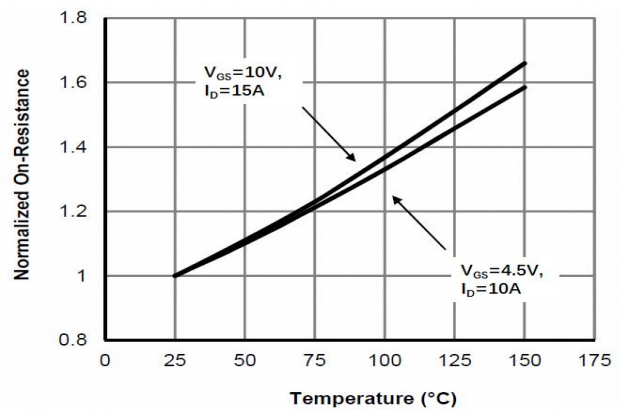


Figure6. Drain-Source on Resistance



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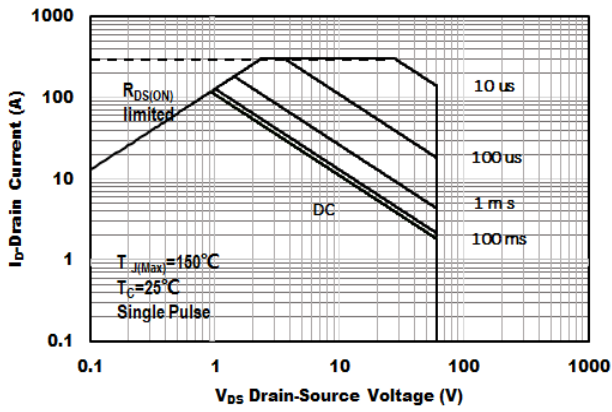


Figure 7. Safe Operation Area

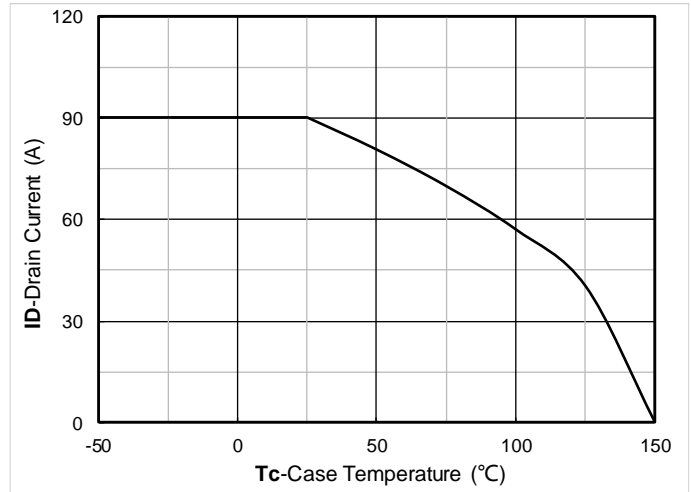


Figure 8. Current dissipation

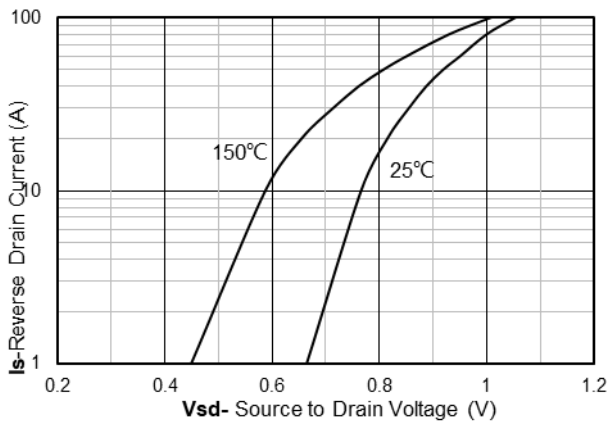


Figure 9. Forward characteristics of reverse diode

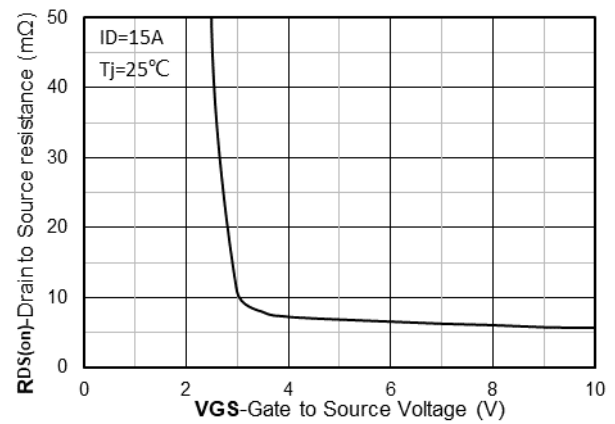


Figure 10. On-Resistance vs Gate to Source Voltage

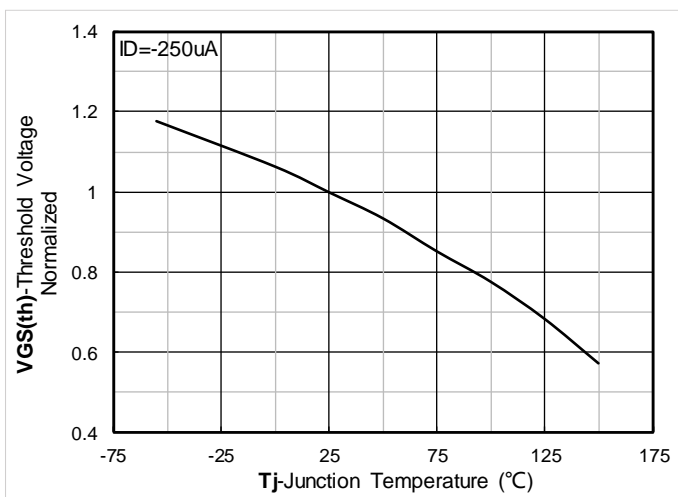


Figure 11. Normalized Threshold voltage

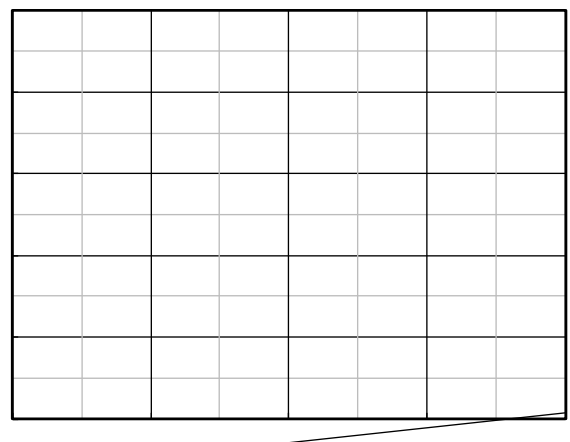


Figure 12. Power dissipation



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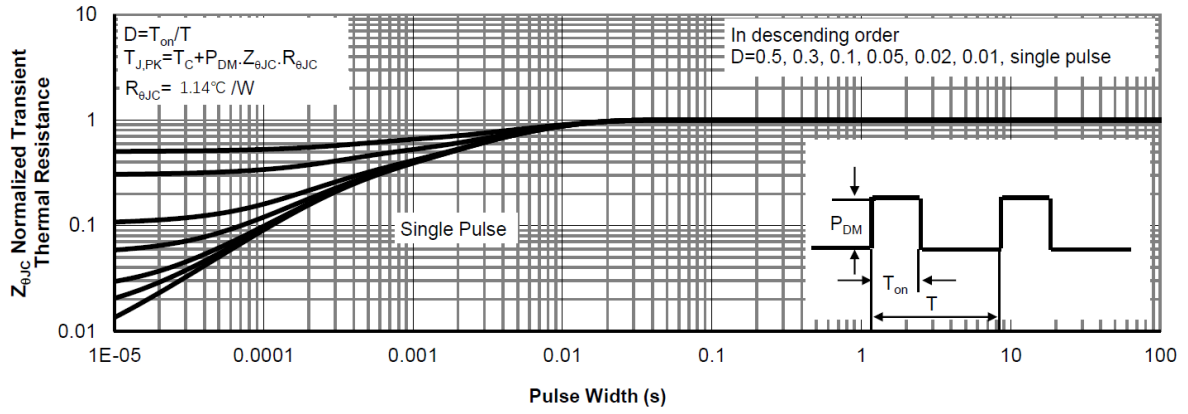
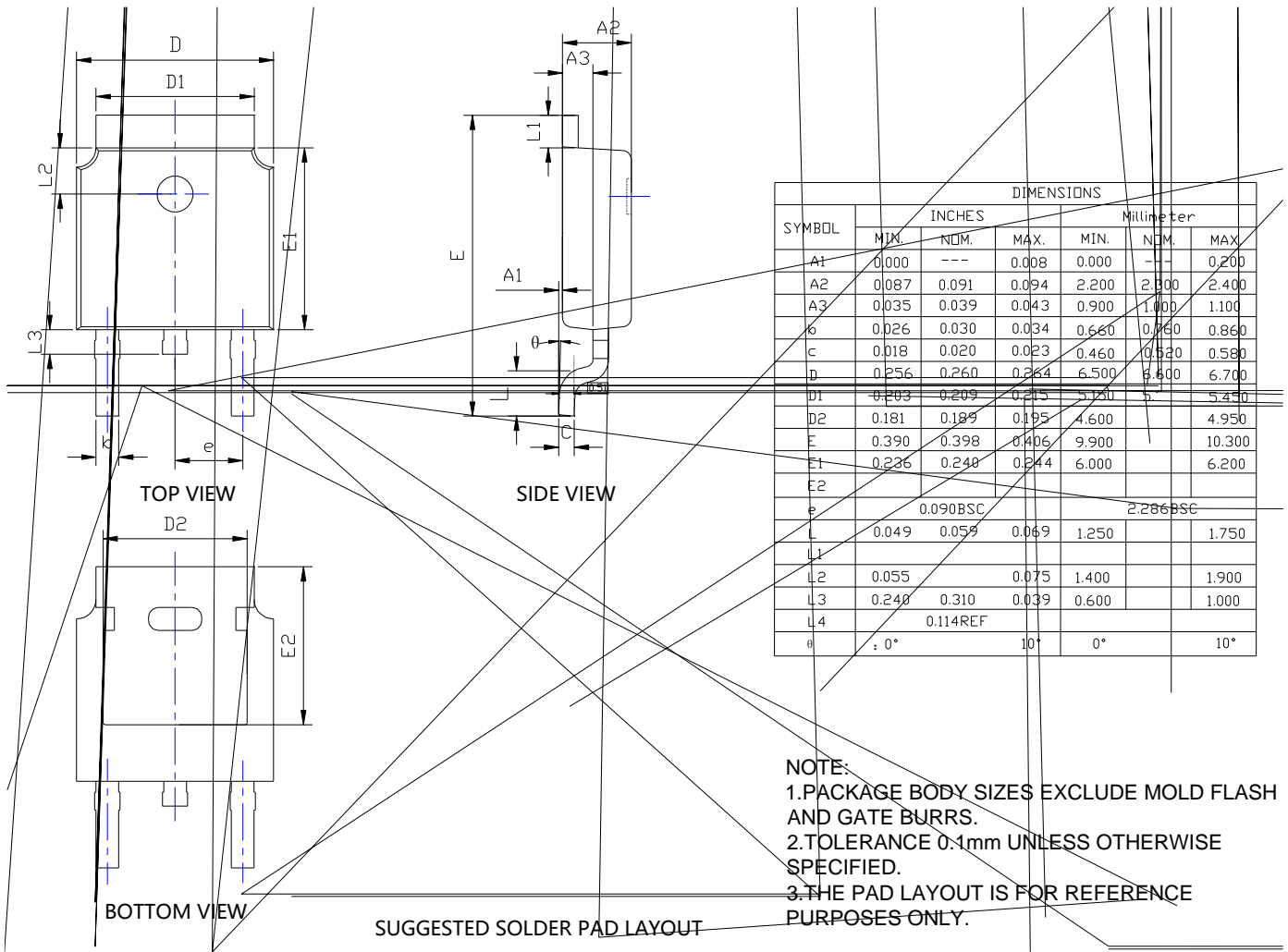


Figure13. Normalized Maximum Transient Thermal Impedance



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■ TO-252-B Package information





YJD90N06A

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