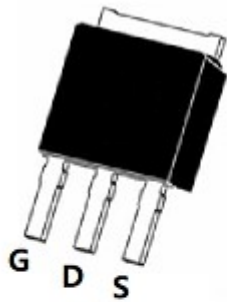
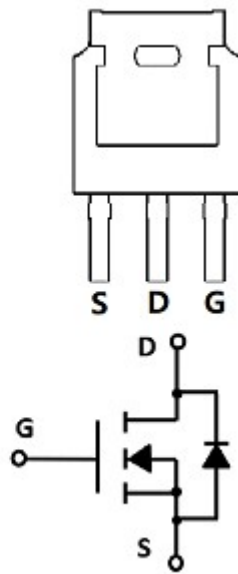


N-Channel Enhancement Mode Field Effect Transistor



TO-251S



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% UIS Tested
- 100% ∇V_{DS} Tested

General Description

- Trench Power MV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

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	$T_C=25^\circ\text{C}$	I_D	20	A
	$T_C=100^\circ\text{C}$		14	
Pulsed Drain Current ^A		I_{DM}	60	A
Total Power Dissipation	$T_C=25^\circ\text{C}$	P_D	34	W
	$T_C=100^\circ\text{C}$		17	W
Single Pulse Avalanche Energy ^B		E_{AS}	20	mJ
Thermal Resistance Junction-to-Case ^C		$R_{\theta JC}$	4.4	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range		T_J, T_{STG}	-55~+175	$^\circ\text{C}$

■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJR20N06A	B1	YJR20N06A	75	/	22500	Tube



YJR20N06A

■ 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 =55℃			5	
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			29	43	mΩ
		V _{GS} = 4.5V, I _D =10A			31	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. Pulse Test: Pulse Width≤300us, Duty cycle ≤2%.

B. R_{θJA} is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. R_{θJC} is guaranteed by design, while R_{θJA} is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.

■ Typical Performance Characteristics

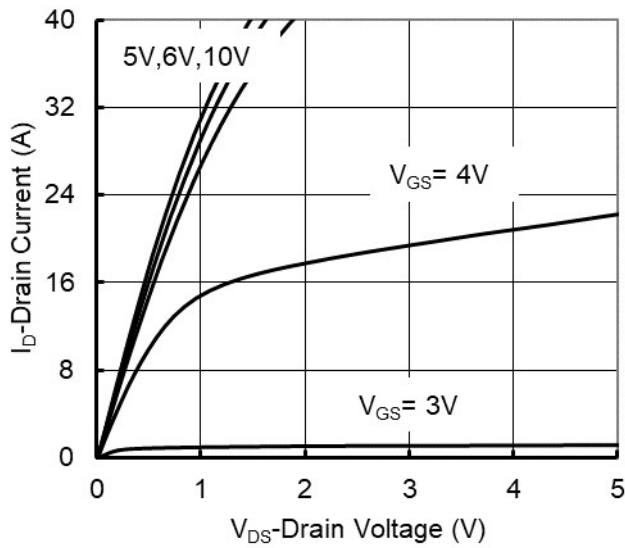


Figure 1. Output Characteristics

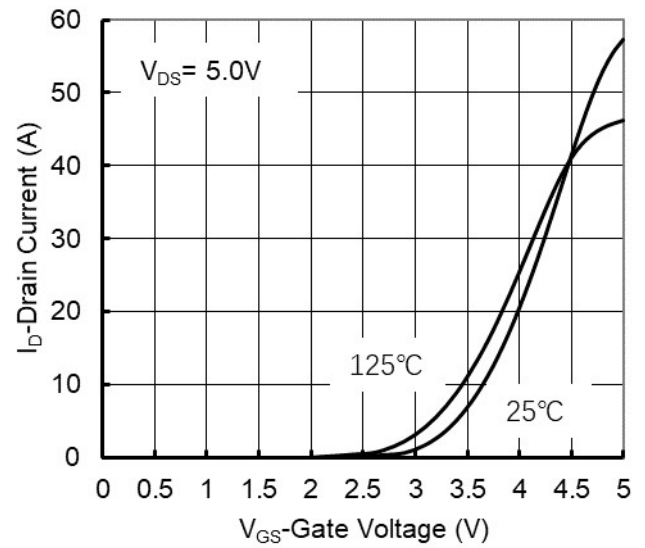


Figure 2. Transfer Characteristics

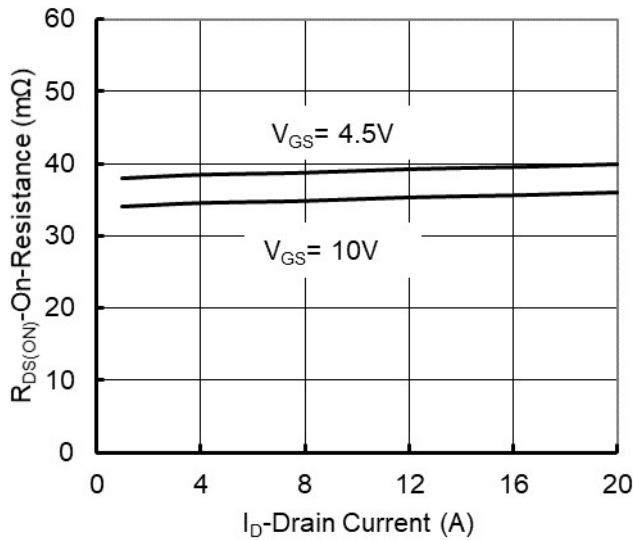


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

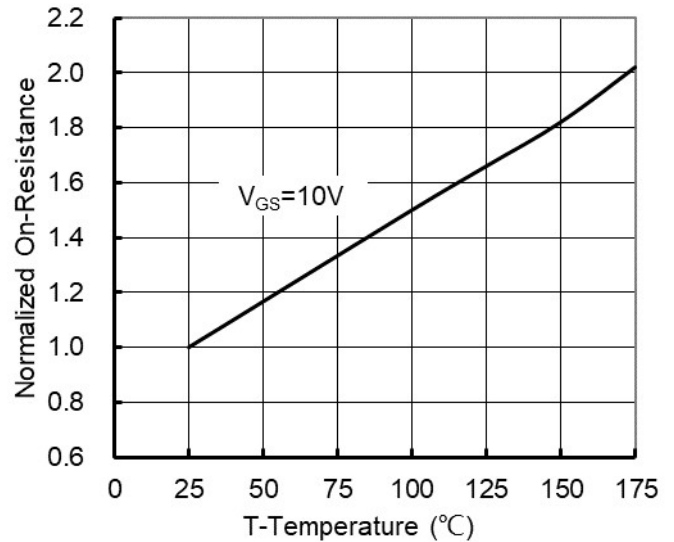


Figure 4. On-Resistance vs. Junction Temperature

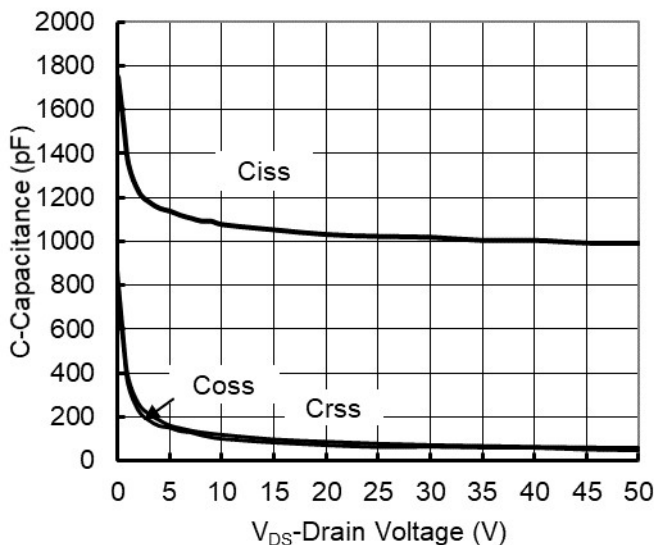


Figure 5. Capacitance Characteristics

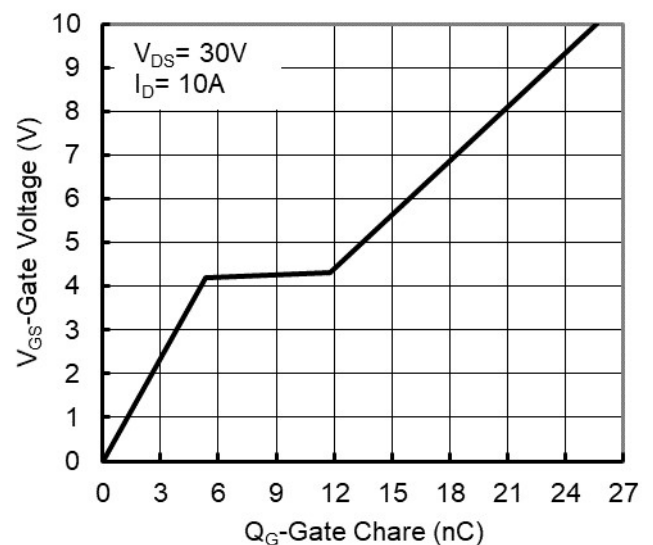


Figure 6. Gate Charge

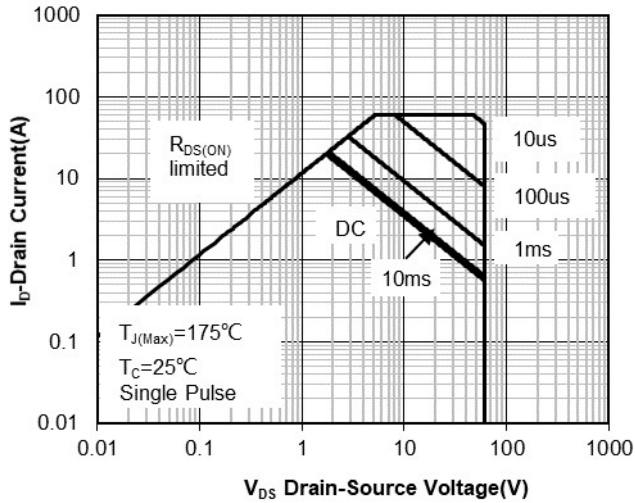


Figure 7. Safe Operation Area

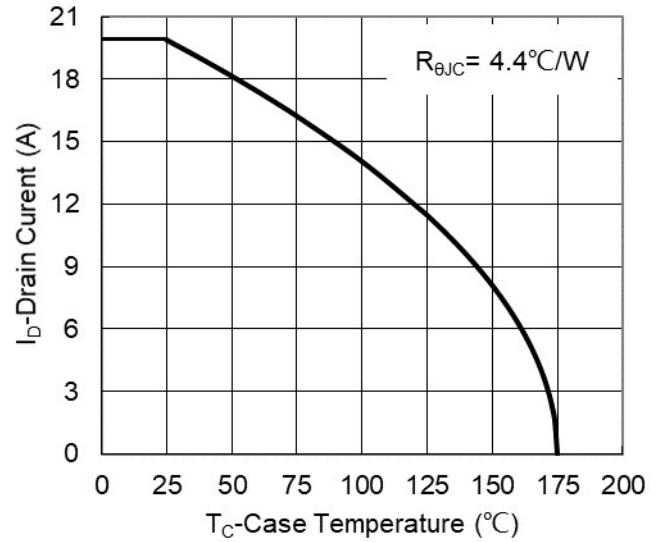


Figure 8. Maximum Continuous Drain Current vs Case Temperature

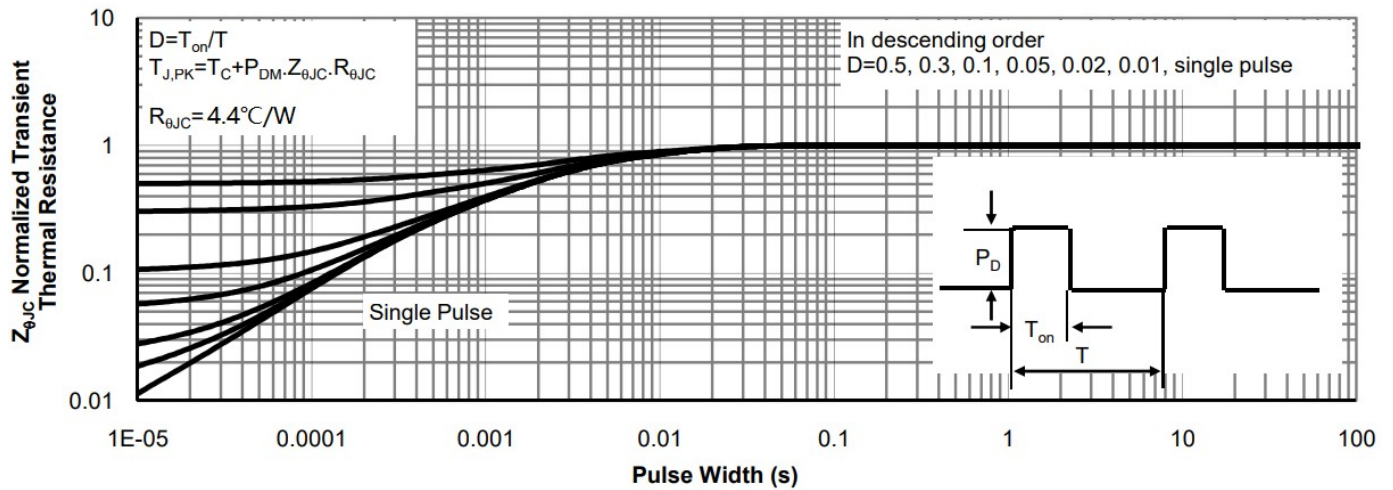
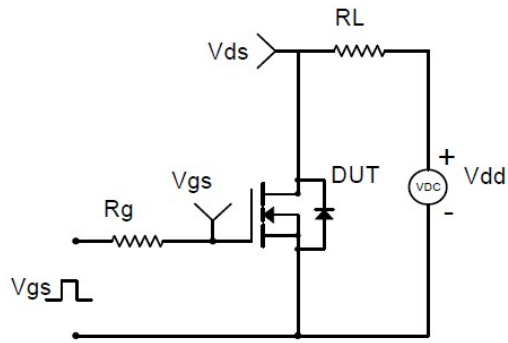
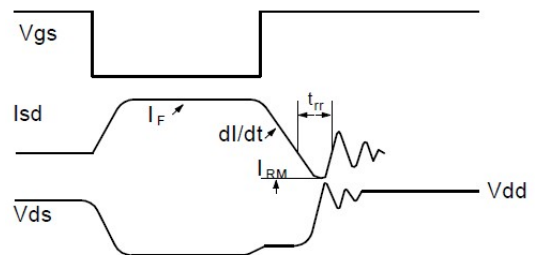
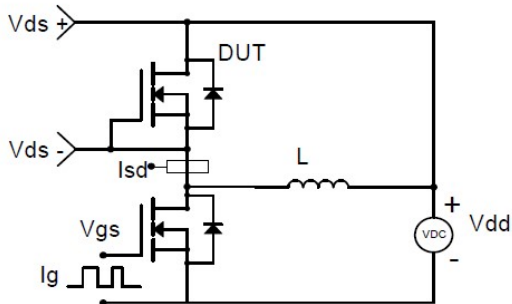


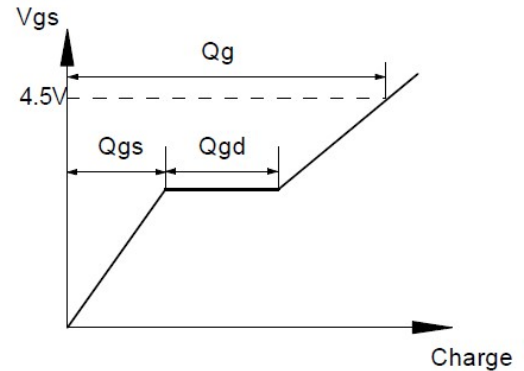
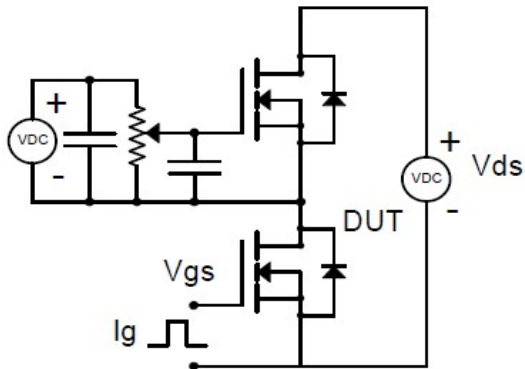
Figure 9. Normalized Maximum Transient Thermal Impedance



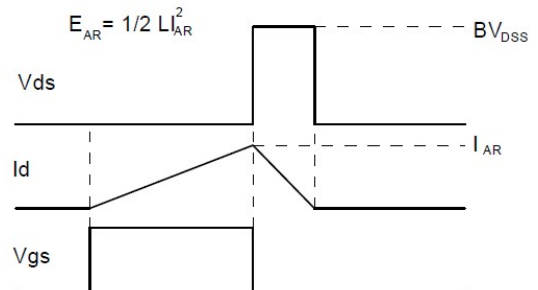
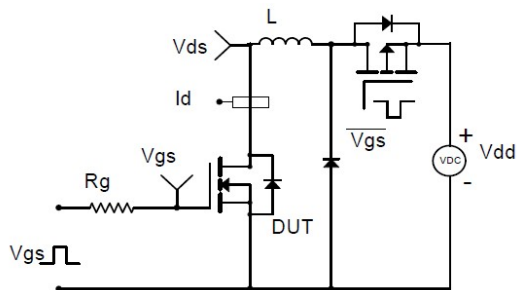
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Gate Charge Test Circuit & Waveform

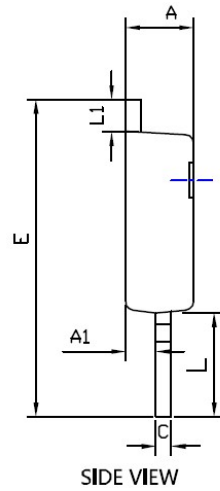
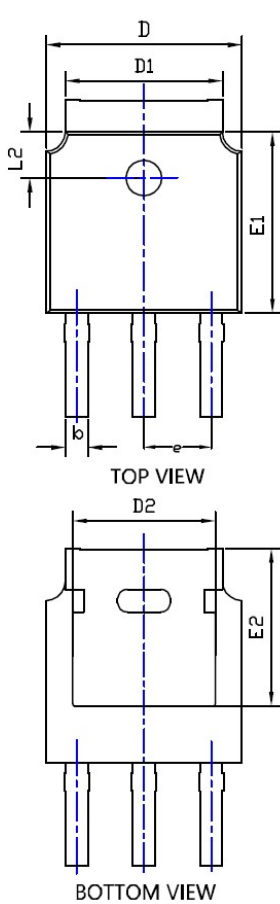


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



YJR20N06A

■ TO-251S Package Information



SYMBOL	DIMENSIONS					
	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.087	0.091	0.094	2.200	2.300	2.400
A1	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	0.409	---	0.453	10.400	---	11.500
E1	0.236	0.240	0.244	6.000	6.100	6.200
E2	0.213REF			5.400REF		
e	0.090BSC			2.286BSC		
L	0.138	---	0.169	3.500	---	4.300
L1	0.035	---	0.050	0.900	---	1.270
L2	0.055	---	0.075	1.400	---	1.900

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



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