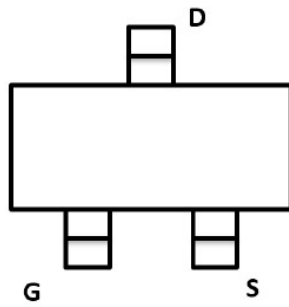
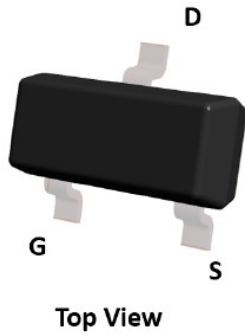
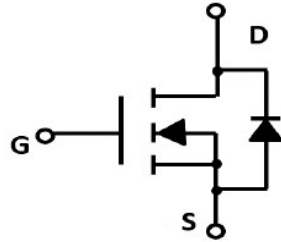


N-Channel Enhancement Mode Field Effect Transistor



SOT-23



Product Summary

- V_{DS} 20V
- I_D 4.5A
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) <25mohm
- $R_{DS(ON)}$ (at $V_{GS}=2.5V$) <32mohm
- $R_{DS(ON)}$ (at $V_{GS}=1.8V$) <46mohm
- 100% ∇V_{DS} Tested

General Description

- Trench Power MV MOSFET technology
- High Power and current handling capability

Applications

- PWM application
- Load switch

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

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	20	V
Gate-source Voltage	V_{GS}	± 10	V
Drain Current	I_D	$T_A=25^\circ C$	4.5
		$T_A=70^\circ C$	3.6
Pulsed Drain Current ^A	I_{DM}	18	A
Total Power Dissipation	P_D	$T_A=25^\circ C$	1
		$T_A=70^\circ C$	0.6
Thermal Resistance Junction-to-Ambient ^B	$R_{\theta JA}$	125	$^\circ C/W$
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
YJL2300A	F2	S0.	3000	30000	120000	7" reel



YJL2300A

■ 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	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V			1	μA
Gate-Body Leakage Current	I _{GSS1}	V _{GS} =±10V, V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.45	0.62	1.0	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =4.5A		19.5	25	mΩ
		V _{GS} =2.5V, I _D =3.0A		25	32	
		V _{GS} =1.8V, I _D =2.7A		33	46	
Diode Forward Voltage	V _{SD}	I _S =4.5A, V _{GS} =0V			1.2	V
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f=1MHZ		418		pF
Output Capacitance	C _{oss}			82		
Reverse Transfer Capacitance	C _{rss}			70		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =4.5V, V _{DS} =10V, I _D =4.5A		6.05		nC
Gate-Source Charge	Q _{gs}			1.07		
Gate-Drain Charge	Q _{gd}			1.95		
Reverse Recovery Charge	Q _{rr}	I _F =4.5A, di/dt=100A/us		1.38		ns
Reverse Recovery Time	t _{rr}			17.9		
Turn-on Delay Time	t _{D(on)}	V _{GS} =4.5V, V _{DS} =10V, R _L =1Ω R _{GEN} =3Ω		4.2		ns
Turn-on Rise Time	t _r			19.8		
Turn-off Delay Time	t _{D(off)}			22.6		
Turn-off fall Time	t _f			23.2		

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

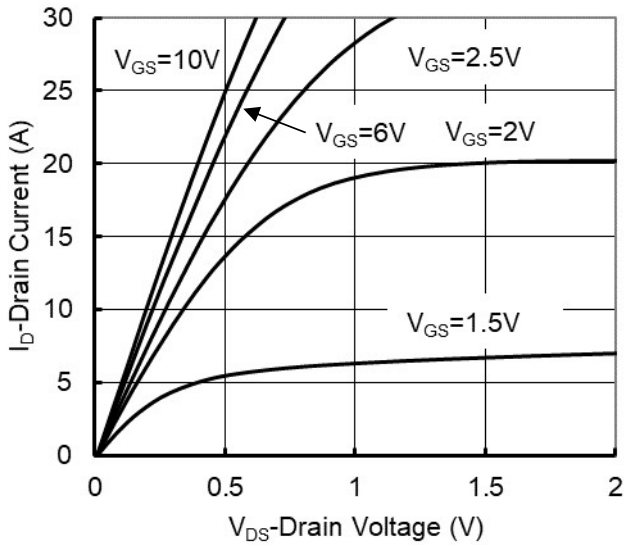


Figure1. Output Characteristics

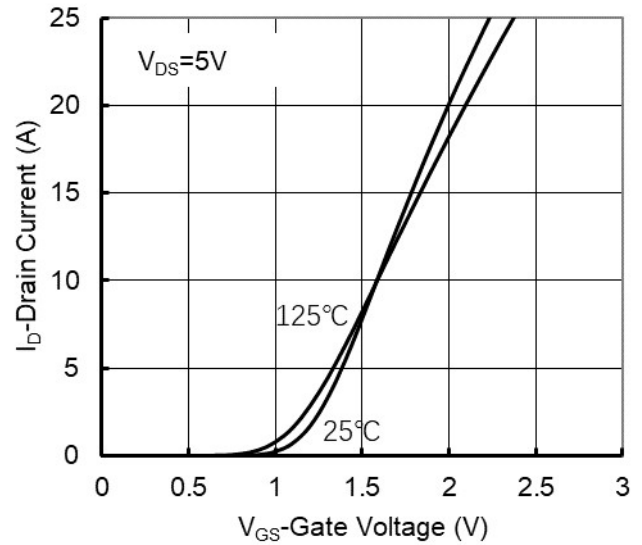


Figure2. Transfer Characteristics

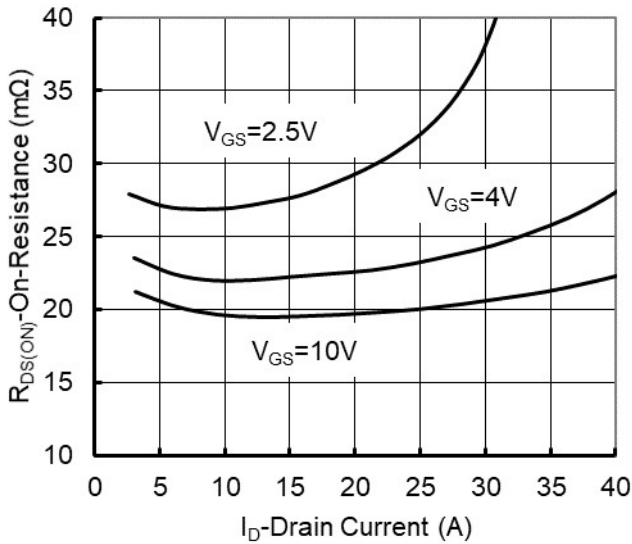


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

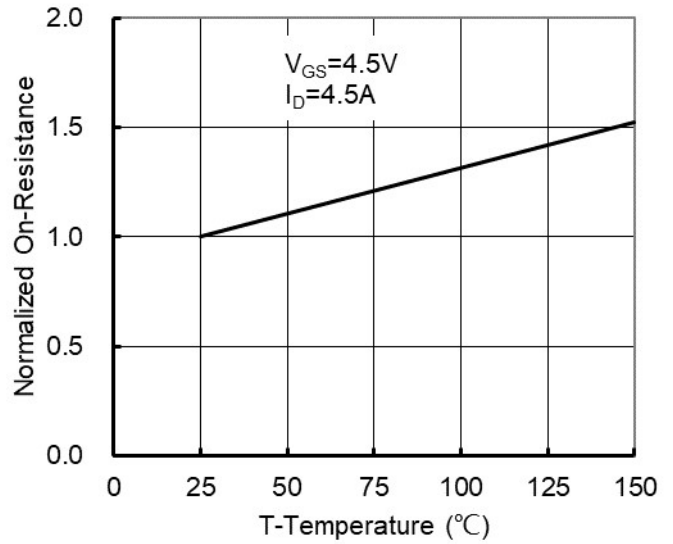


Figure 4: On-Resistance vs. Junction Temperature

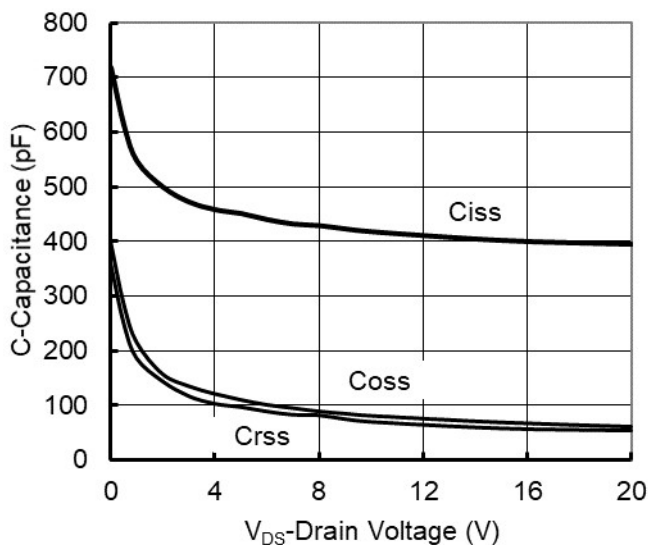


Figure5. Capacitance Characteristics

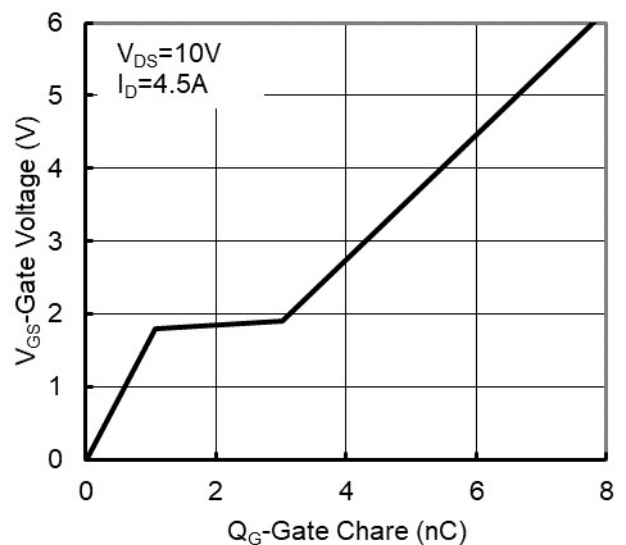


Figure6. Gate Charge



YJL2300A

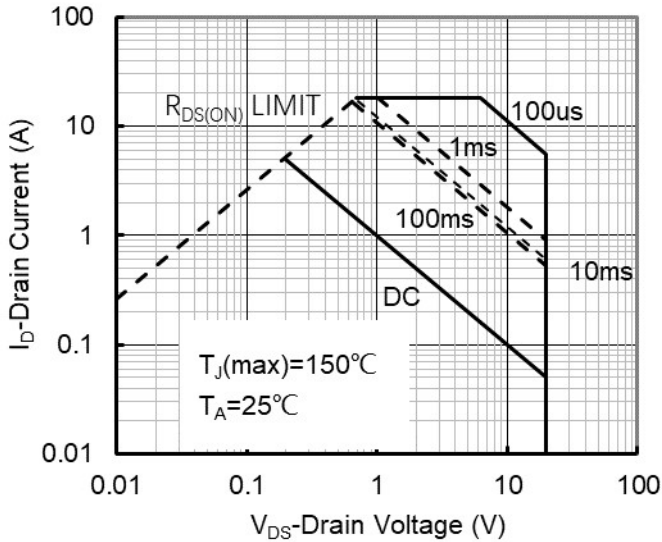


Figure7. Safe Operation Area

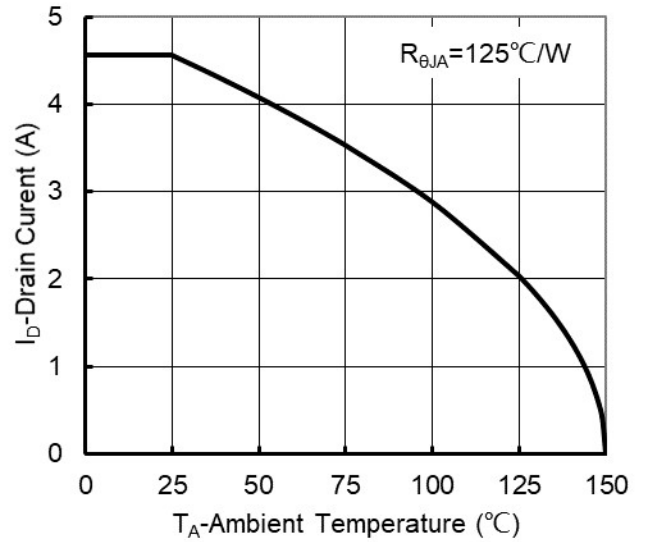


Figure8. Maximum Continuous Drain Current vs Ambient Temperature

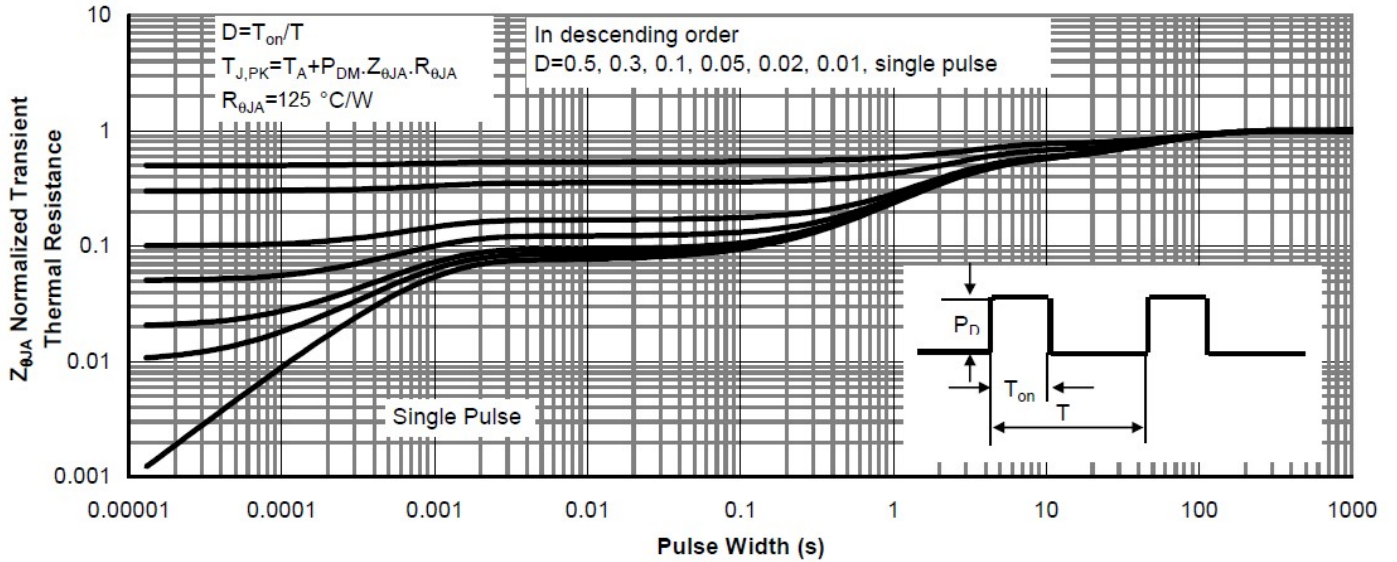
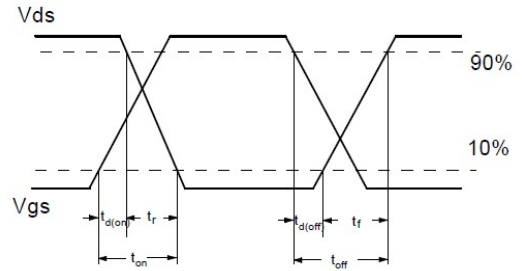
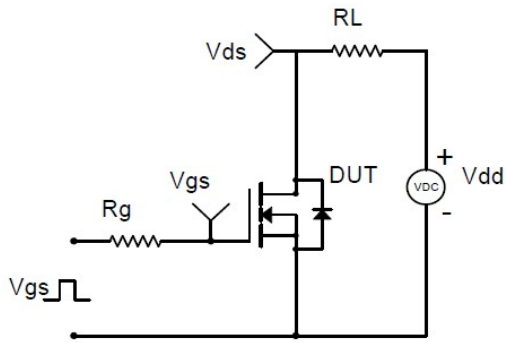
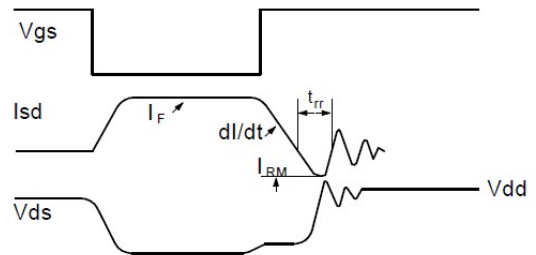
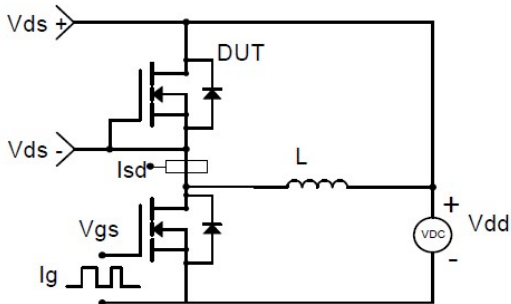


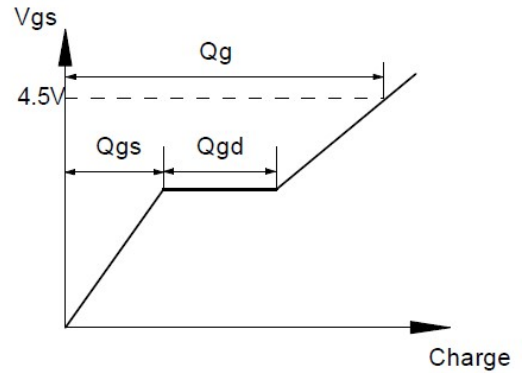
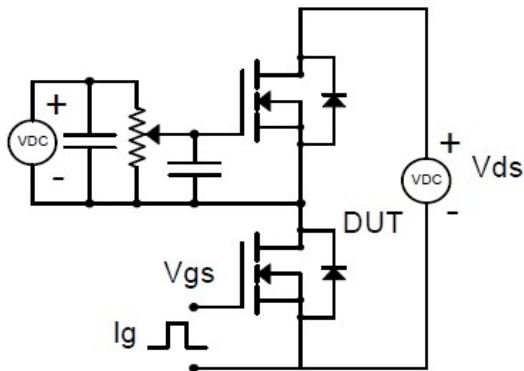
Figure9. Normalized Maximum Transient Thermal Impedance



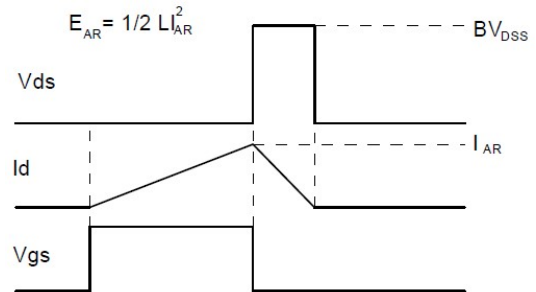
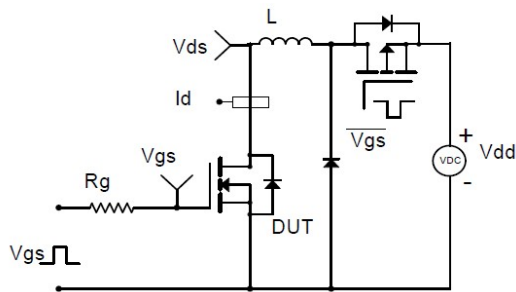
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Gate Charge Test Circuit & Waveform

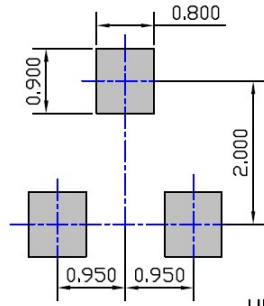
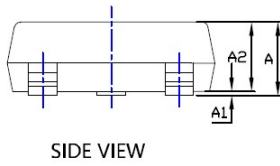
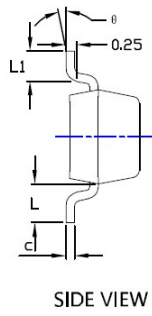
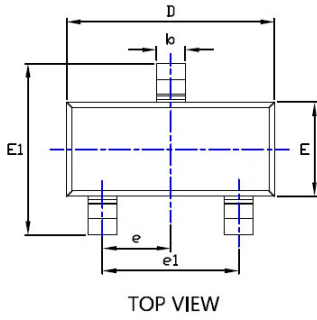


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



YJL2300A

■ SOT-23 Package information



UNIT: mm

SUGGESTED SOLDER PAD LAYOUT

SYMBOL	DIMENSIONS					
	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.035	---	0.045	0.900	---	1.150
A1	0.000	---	0.004	0.000	---	0.100
A2	0.035	0.038	0.041	0.900	0.975	1.050
b	0.012	0.016	0.020	0.300	0.400	0.500
c	0.004	---	0.008	0.100	---	0.200
D	0.110	0.114	0.118	2.800	2.900	3.000
E	0.047	0.051	0.055	1.200	1.300	1.400
E1	0.089	0.094	0.100	2.250	2.400	2.550
e	0.037 TYP			0.950 TYP		
e1	0.071	0.075	0.079	1.800	1.900	2.000
L	0.022 REF			0.550 REF		
L1	0.012	0.016	0.200	0.300	0.400	0.500
θ	0°	---	8°	0°	---	8°

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.



YJL2300A

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