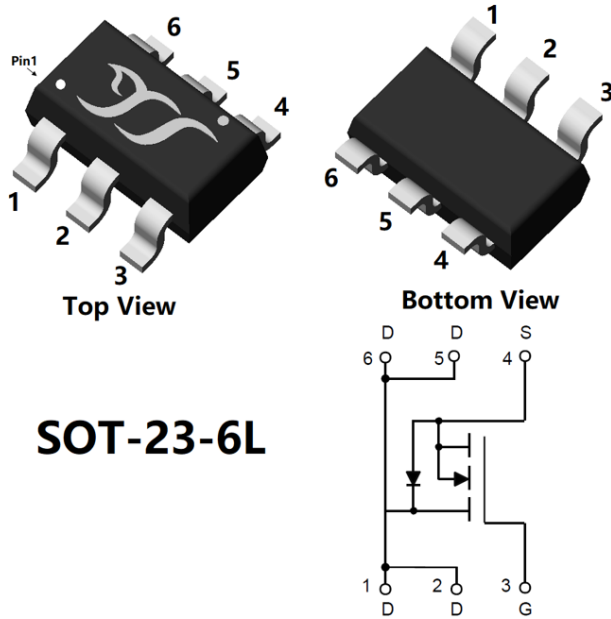


N-Channel Enhancement Mode Field Effect Transistor



Product Summary

- V_{DS} 100V
- I_D 3.0A
- $R_{DS(ON)}$ (at $V_{GS}= 10V$) < 120mohm
- $R_{DS(ON)}$ (at $V_{GS}= 4.5V$) < 140mohm

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

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

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	100	V
Gate-source Voltage	V_{GS}	± 20	V
Drain Current	I_D	$T_A=25^\circ\text{C}$	3
		$T_A=70^\circ\text{C}$	2.4
Pulsed Drain Current ^A	I_{DM}	12	A
Single Pulse Avalanche Energy	E_{AS}	8	mJ
Total Power Dissipation @ $T_A=25^\circ\text{C}$	P_D	1.5	W
Thermal Resistance Junction-to-Ambient ^B	$R_{\theta JA}$	83	$^\circ\text{C}/\text{W}$
Thermal Resistance From Junction To Lead	$R_{\theta JL}$	36	$^\circ\text{C}/\text{W}$
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
YJS03N10A	F2	1003	3000	30000	120000	7"



YJS03N10A

■ Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.1	1.8	3.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=3A$		95	120	m Ω
		$V_{GS}=4.5V, I_D=2.4A$		100	140	
Diode Forward Voltage	V_{SD}	$I_S=3A, V_{GS}=0V$		0.8	1.2	V
Maximum Body-Diode Continuous Current	I_S				3	A
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, f=1\text{MHz}$		1070		pF
Output Capacitance	C_{oss}			33		
Reverse Transfer Capacitance	C_{rss}			30		
Switching Parameters						
Total Gate Charge	Q_g	$V_{GS}=10V, V_{DS}=50V, I_D=10A$		26		nC
Gate-Source Charge	Q_{gs}			5.4		
Gate-Drain Charge	Q_{gd}			5.8		
Reverse Recovery Charge	Q_{rr}	$I_F=10A, di/dt=100A/\mu s$		30.1		ns
Reverse Recovery Time	t_{rr}			40		
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DD}=50V, R_L=6.4\Omega$ $R_{GEN}=3\Omega$		7		ns
Turn-on Rise Time	t_r			24		
Turn-off Delay Time	$t_{D(off)}$			24		
Turn-off fall Time	t_f			31		

A. Pulse Test: Pulse Width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

B. $R_{\theta JA}$ is the sum of the junction-to-lead and lead-to-ambient thermal resistance, where the lead thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JL}$ is guaranteed by design, while $R_{\theta JA}$ 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

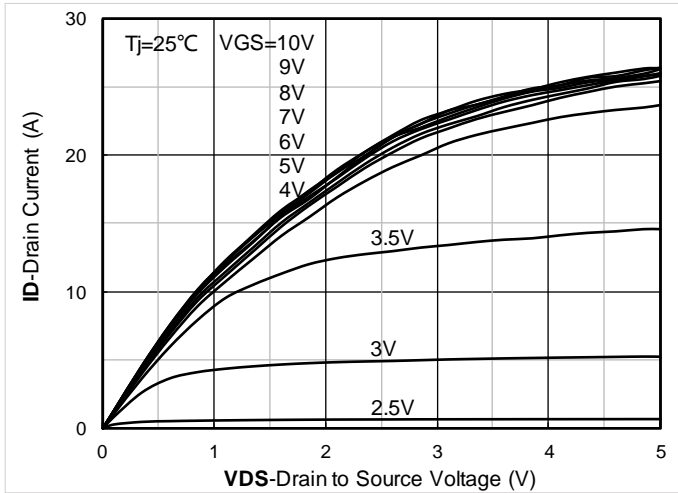


Figure 1. Output Characteristics

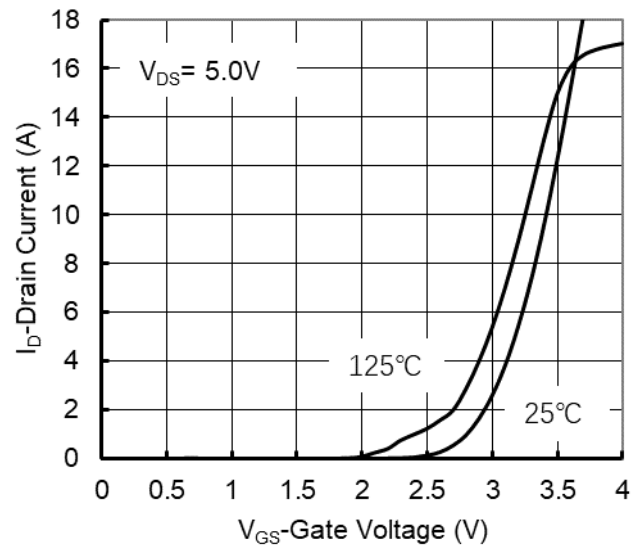


Figure 2. Transfer Characteristics

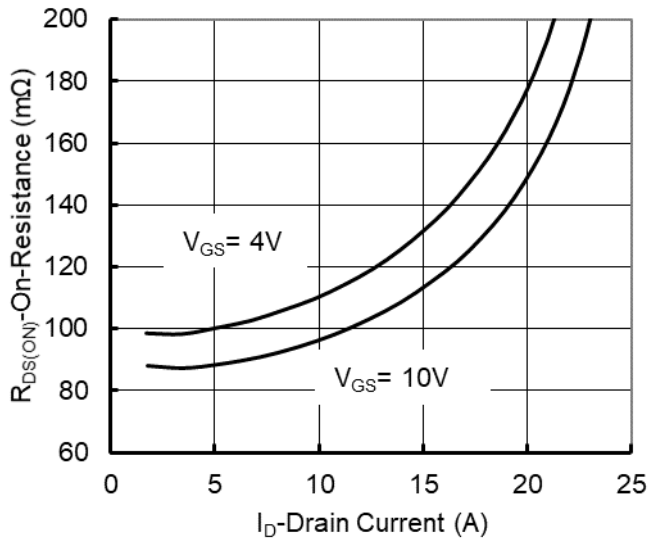


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

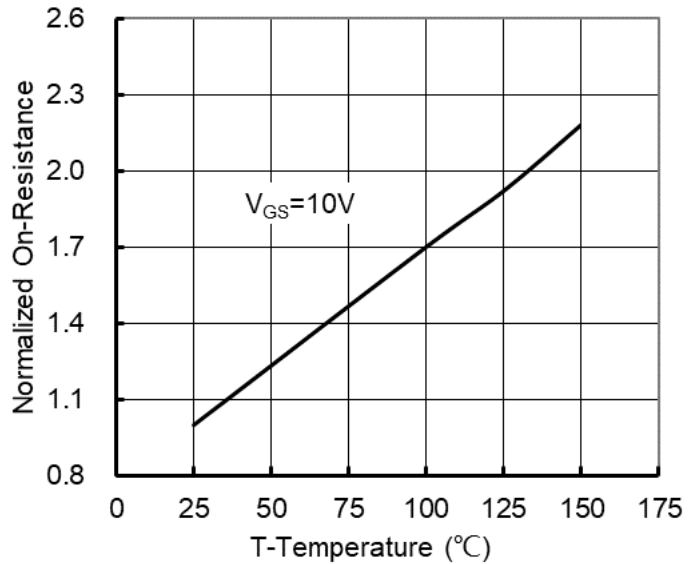


Figure 4. On-Resistance vs. Junction Temperature

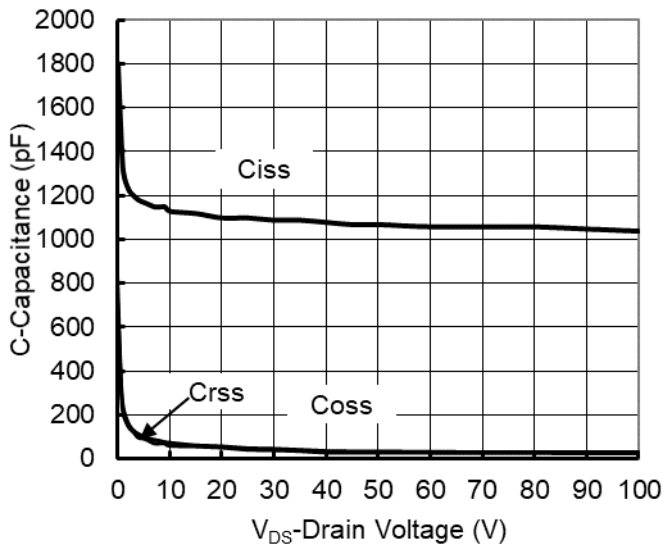


Figure 5. Capacitance Characteristics

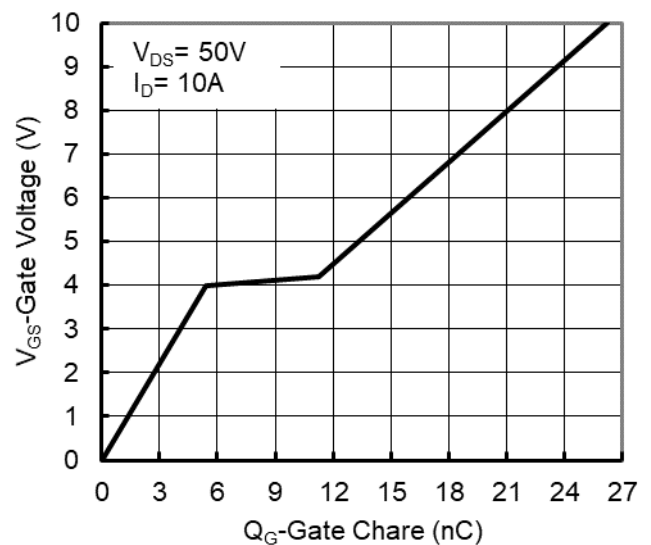


Figure 6. Gate Charge



YJS03N10A

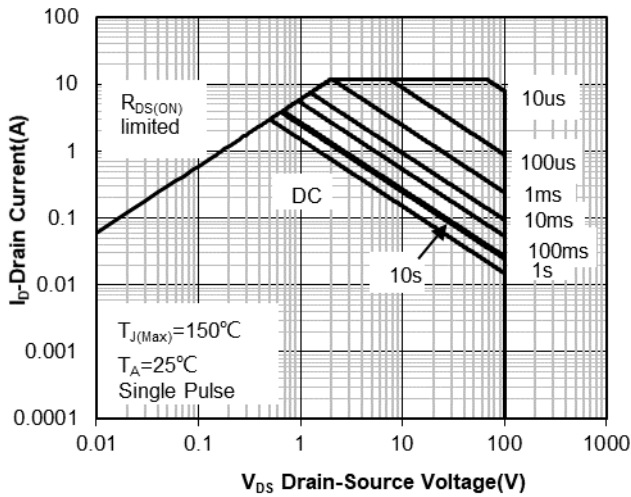


Figure 7. Safe Operation Area

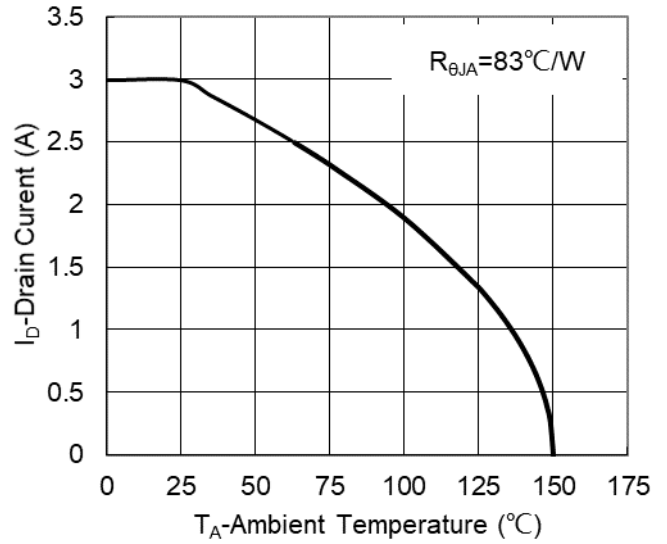


Figure 8. Maximum Continuous Drain Current vs Ambient Temperature

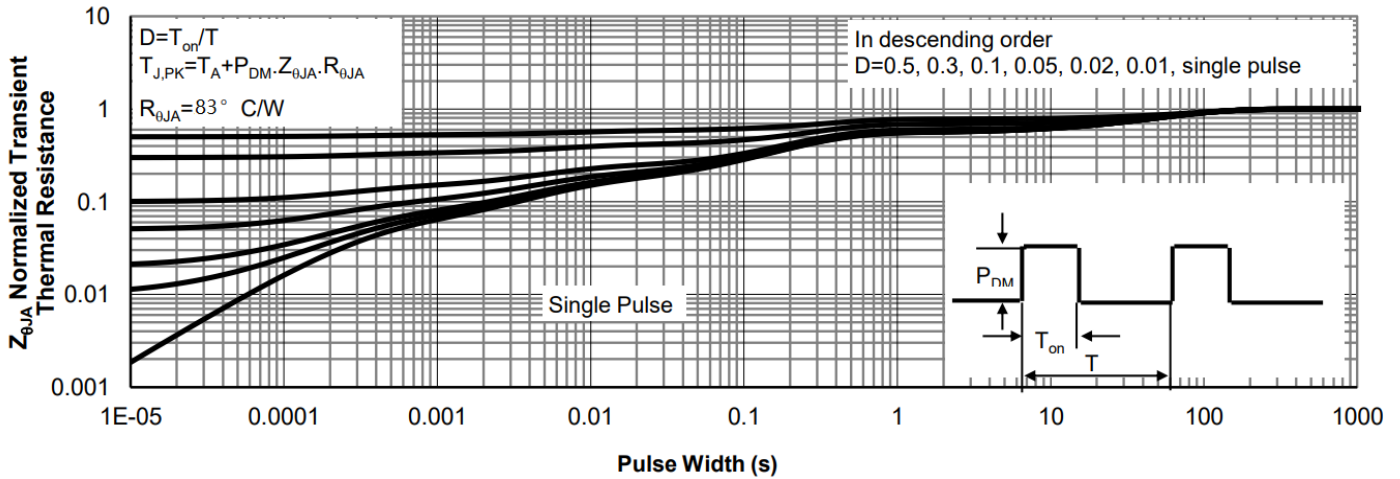


Figure 9. Normalized Maximum Transient Thermal Impedance

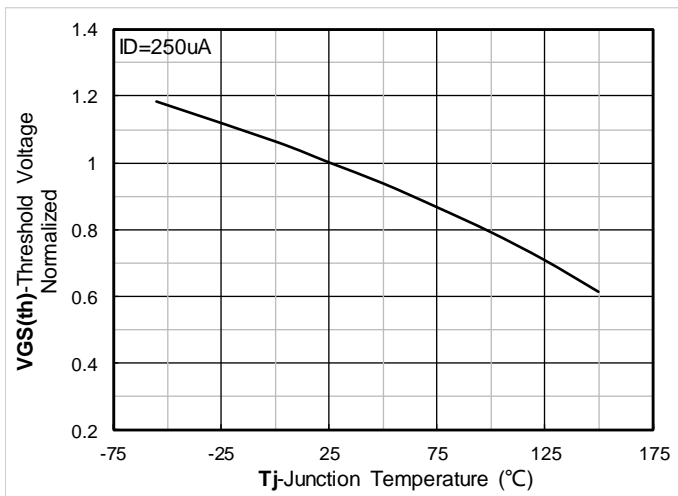
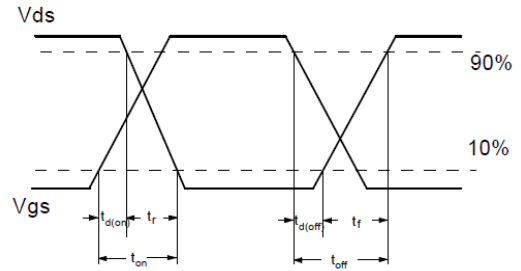
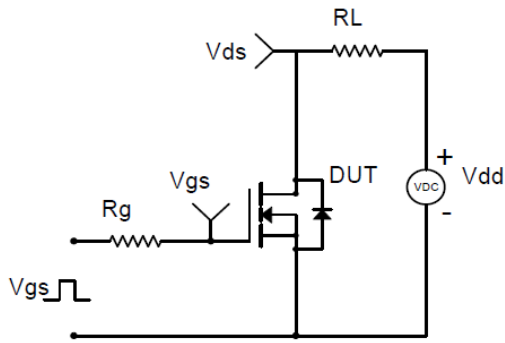
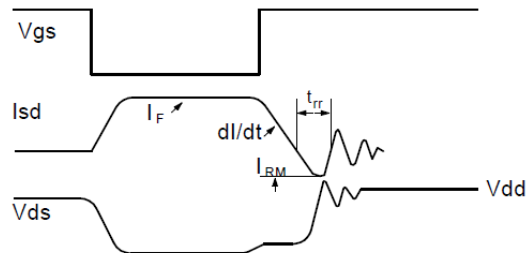
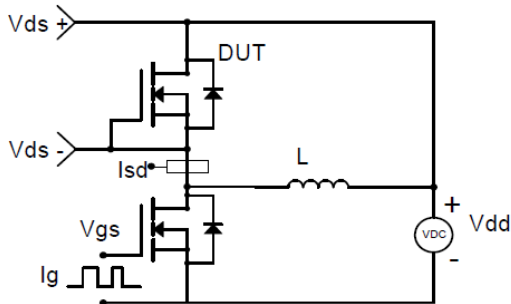


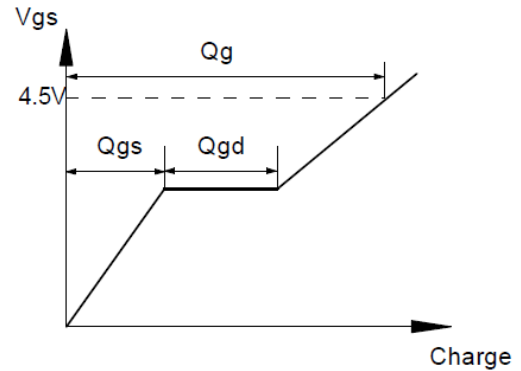
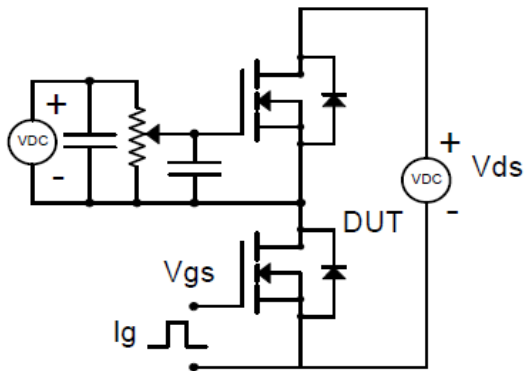
Figure 10. Normalized Threshold voltage



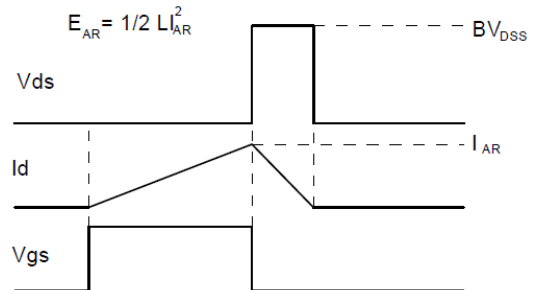
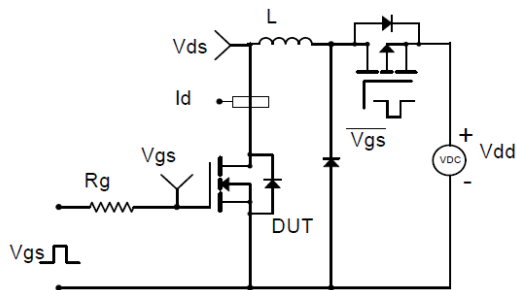
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Gate Charge Test Circuit & Waveform

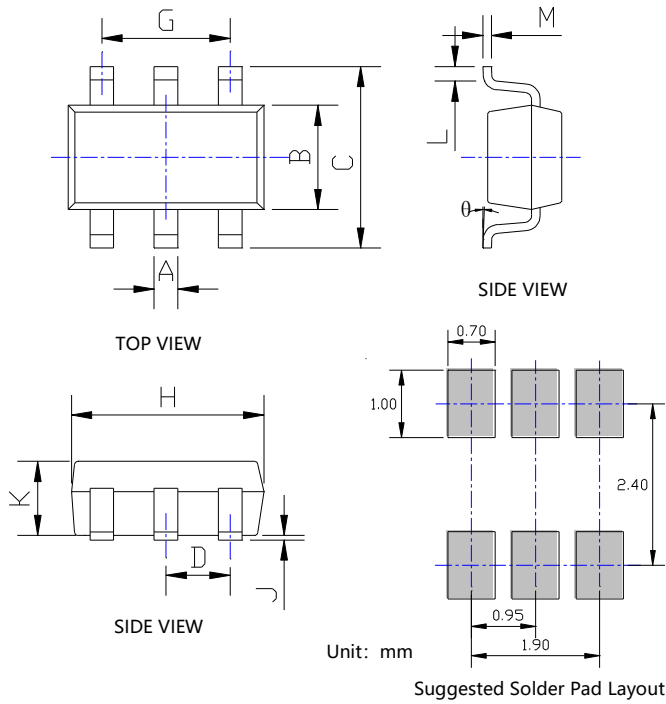


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



YJS03N10A

■SOT-23-6L Package information



SYMBOL	DIMENSIONS			
	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.012	0.020	0.300	0.500
B	0.059	0.067	1.500	1.700
C	0.104	0.116	2.650	2.950
D	0.037BSC		0.950BSC	
G	0.075BSC		1.900BSC	
H	0.111	0.119	2.820	3.020
J	0.000	0.004	0.000	0.100
K	0.041	0.045	1.050	1.150
L	0.012	0.024	0.300	0.600
M	0.004	0.008	0.100	0.200
θ	0°	8°	0°	8°

Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.



YJS03N10A

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