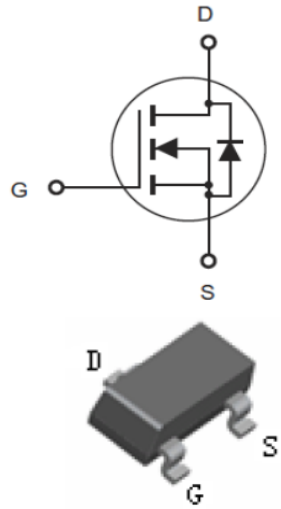
N-Channel Enhancement Mode Field Effect Transistor



SOT-23

Feature

●V_{DS}=20V,ID=4.5A
$R_{DS(ON)}$<25mΩ@V_{GS}=4.5V
$R_{DS(ON)}$<38mΩ@V_{GS}=2.5V

●Epoxy meets UL 94 V-0 flammability rating
●Moisture Sensitivity Level1
●High density cell design for low $R_{DS(ON)}$
●High Speed switching
●Rugged and reliable
●SOT-23 Package

Application

●Battery protection
●Load switch
●Power management

■ Maximum Ratings (T_A=25℃ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source Voltage	20	V
V_{GS}	Gate-source Voltage	±10	V
I_D	Drain Current	4.5	A
I_{DM}	Pulsed Drain Current	17	A
P_D	Total Power Dissipation	1	W
R_{thJA}	Thermal Resistance From Junction To Ambient	125	℃/W
T_J	Operation Junction Temperature	-55～+150	℃
T_{STG}	Storage Temperature	-55～+150	℃

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJL2300A	F2		3000	30000	120000	7” reel

■ Electrical Characteristics (T_A=25℃ unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	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_{GSS}	V_{GS}= ±10V, V_{DS}=0V			±100	nA
Gate threshold voltage*	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	0.5	0.7	0.9	V
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=4.0A		25	38	
Forward Transconductance	g_{FS}	V_{DS}= 5V, I_D=4.5A	5			s
Dynamic Characteristics **						
Input Capacitance	C_{iss}	VDS=10V,VGS=0V,f=1MHZ		482		pF
Output Capacitance	C_{oss}			85		
Reverse Transfer Capacitance	C_{rss}			52		
Switching Characteristics**						
Turn-on delay time	$t_{d(on)}$	V_{DD}=10V,V_{GS}=4.5V,RL=2.8Ω,I_D=1A,R_{GEN}=6Ω		13		ns
Turn-on rise time	t_r			54		
Turn-off delay time	$t_{d(off)}$			18		
Turn-off Fall time	t_f			11		
Total Gate Charge	Q_g	V_{DS}=10V,I_D=4.5A,V_{GS}=4.5V		4.2		nC
Gate-Source Charge	Q_{gs}			0.9		
Gate-Drain Charge	Q_{gd}			1.4		
Source-Drain Diode characteristics						
Drain-Source Diode Forward Current	I_S				4.5	A
Diode Forward voltage	V_{SD}	V_{GS}=0V,I_S=4.5A		0.8	1.2	V

Notes:
*Pulse Test: Pulse Width≤300μA, Duty Cycle≤2%.
**These parameters have no way to verify.

■ **Characteristics** (Typical)

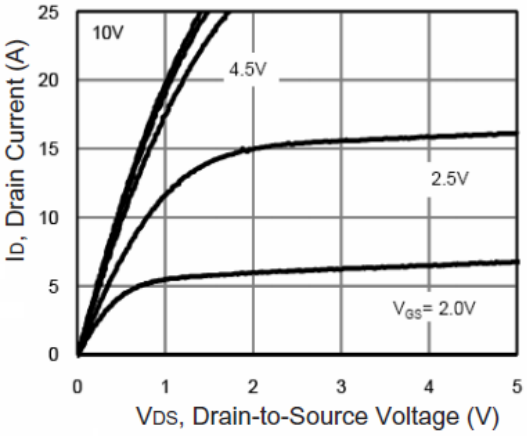


Figure 1. Output Characteristics

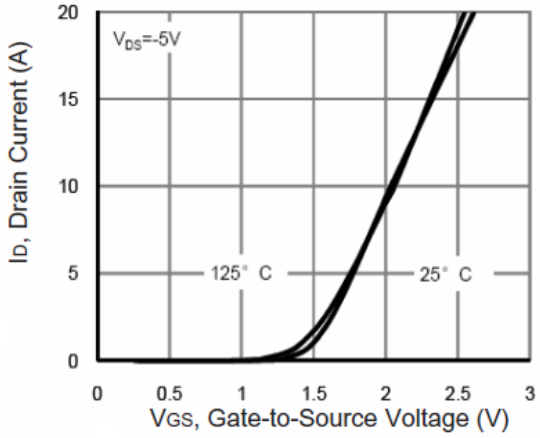


Figure 2. Transfer Characteristics

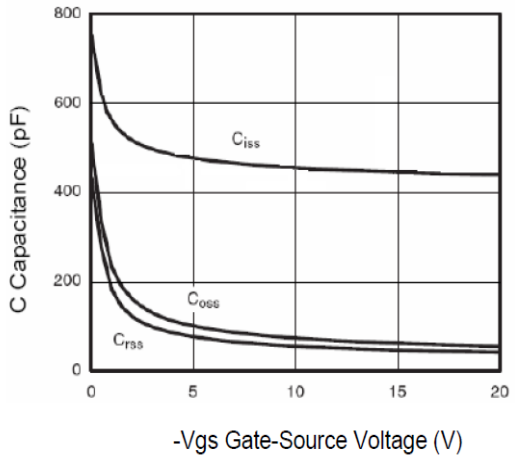


Figure 3. Capacitance

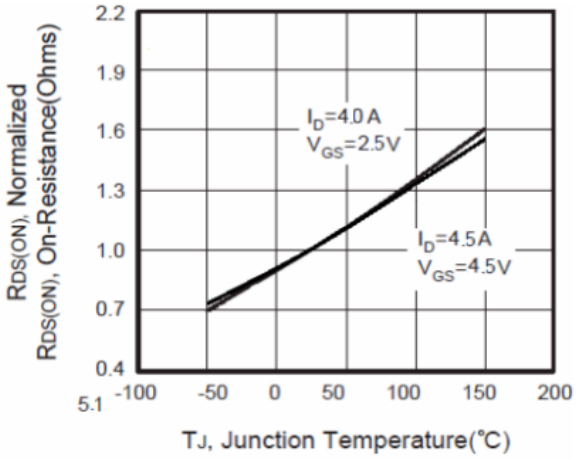


Figure 4. On-Resistance Variation with Temperature

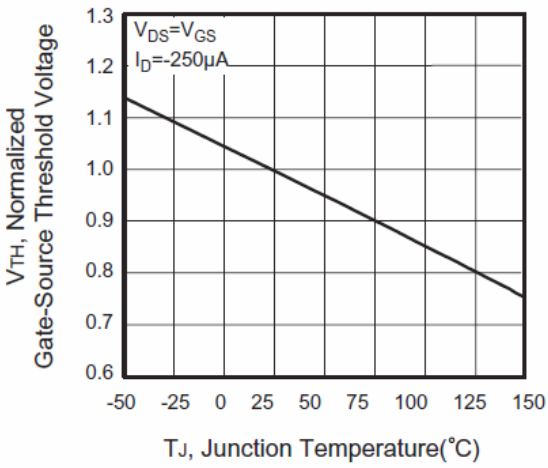


Figure 5. Gate Threshold Variation with Temperature

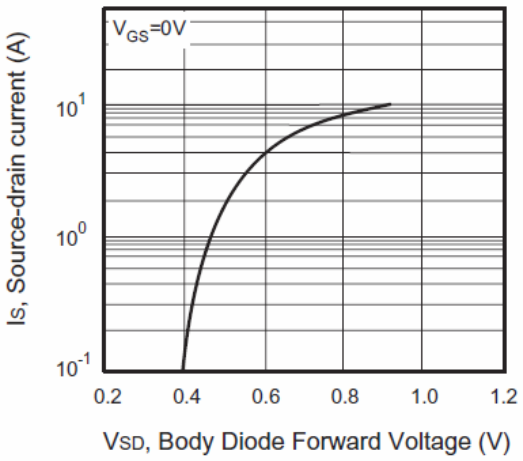
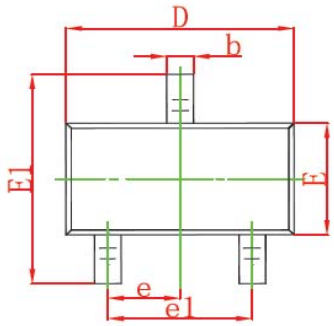
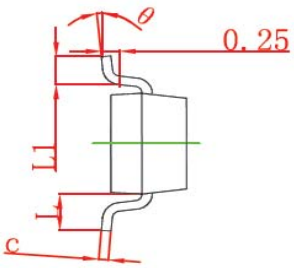
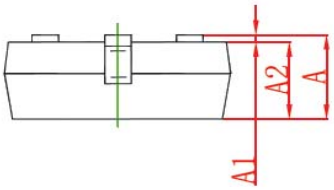


Figure 6. Body Diode Forward Voltage Variation with Source Current

■ SOT-23 Package Outline Dimensions

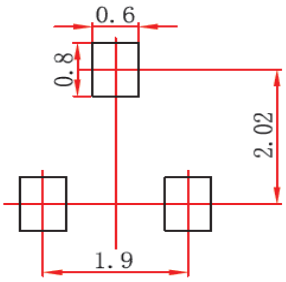






Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

■ SOT-23 Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

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