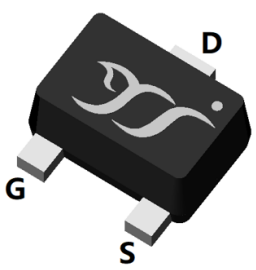
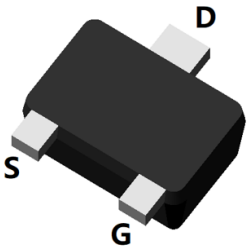
N-Channel Enhancement Mode Field Effect Transistor

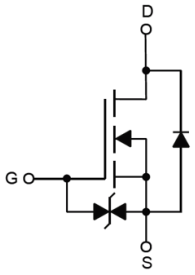


Top View



Bottom View

SOT-723



Product Summary

- V_{DS} 20 V
- I_D 0.5 A
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜300 mohm
- $R_{DS(ON)}$(at V_{GS}=2.5V) ＜400 mohm
- $R_{DS(ON)}$(at V_{GS}=1.8V) ＜700 mohm
- ESD Protected Up to 2.0KV (HBM)

General Description

- Trench Power LV MOSFET technology
- High Power and current handing capability

Applications

- PWM application
- Load switch

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

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	20	V
Gate-source Voltage		V_{GS}	±12	V
Drain Current	T_A=25℃	I_D	0.5	A
	T_A=100℃		0.3	
Pulsed Drain Current [A]		I_{DM}	4	A
Total Power Dissipation [B]	T_A=25℃	P_D	0.25	W
	T_A=100℃		0.1	
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	℃

■Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient [C]	Steady-State	$R_{\theta JA}$	420	500	℃/W

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJL3134KAT	F2	4A	8000	80000	320000	7“ reel

■ 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	20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V	-	-	1	μA
		V_{DS}=20V, V_{GS}=0V, Tj=150℃	-	-	100	
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±10V, V_{DS}=0V	-	2	±10	uA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	0.35	0.75	1.1	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=0.5A	-	200	300	mΩ
		V_{GS}=2.5V, I_D=0.4A	-	290	400	
		V_{GS}=1.8V, I_D=0.2A	-	480	700	
Diode Forward Voltage	V_{SD}	I_S=0.5A, V_{GS}=0V	-	0.9	1.2	V
Gate resistance	R_G	f=1MHz, Open drain	-	50	-	Ω
Maximum Body-Diode Continuous Current	I_S		-	-	0.5	A
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=10V, V_{GS}=0V, f=1MHz	-	56	-	pF
Output Capacitance	C_{oss}		-	20	-	
Reverse Transfer Capacitance	C_{rss}		-	2.5	-	
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=4.5V, V_{DS}=10V, I_D=0.5A	-	1	-	nC
Gate-Source Charge	Q_{gs}		-	0.28	-	
Gate-Drain Charge	Q_{gd}		-	0.22	-	
Reverse Recovery Charge	Q_{rr}	I_F=0.5A, di/dt=20A/us	-	0.4	-	nC
Reverse Recovery Time	t_{rr}		-	14.4	-	ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=4.5V, V_{DD}=10V, I_D=0.5A R_{GEN}=10Ω	-	2	-	nS
Turn-on Rise Time	t_r		-	18.8	-	
Turn-off Delay Time	$t_{D(off)}$		-	10	-	
Turn-off fall Time	t_f		-	23	-	

A. Repetitive rating; pulse width limited by max. junction temperature.
B. P_d is based on max. junction temperature, using junction-case thermal resistance.
C. The value of $R_{\theta JA}$ is measured with the device mounted on the minimum recommend pad size, in the still air environment with T_A =25℃. The maximum allowed junction temperature of 150℃. The value in any given application depends on the user's specific board design.

■Typical Electrical and Thermal Characteristics Diagrams

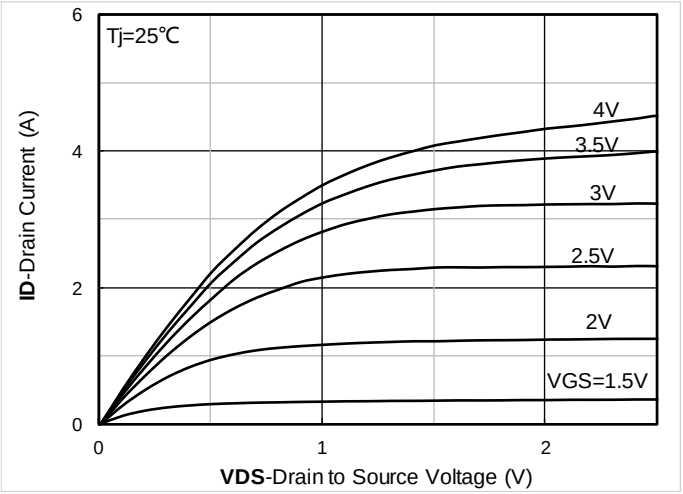


Figure1. Output Characteristics

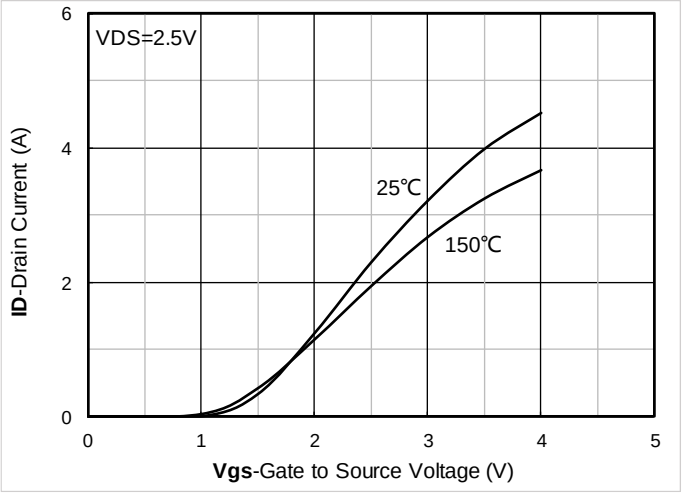


Figure2. Transfer Characteristics

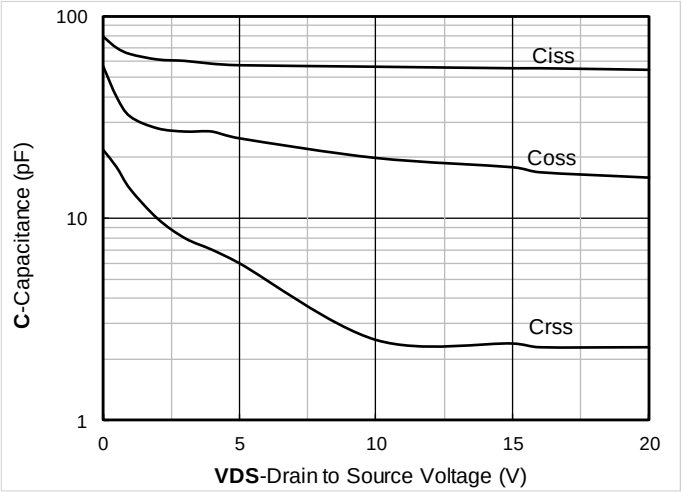


Figure3. Capacitance Characteristics

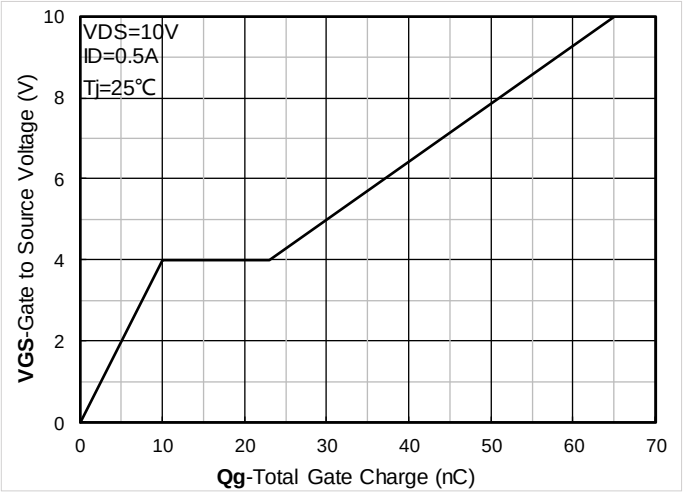


Figure4. Gate Charge

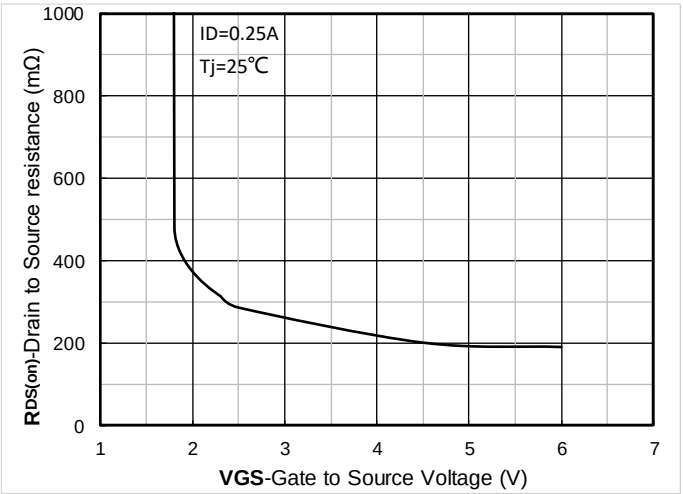


Figure5. On-Resistance vs Gate to Source Voltage

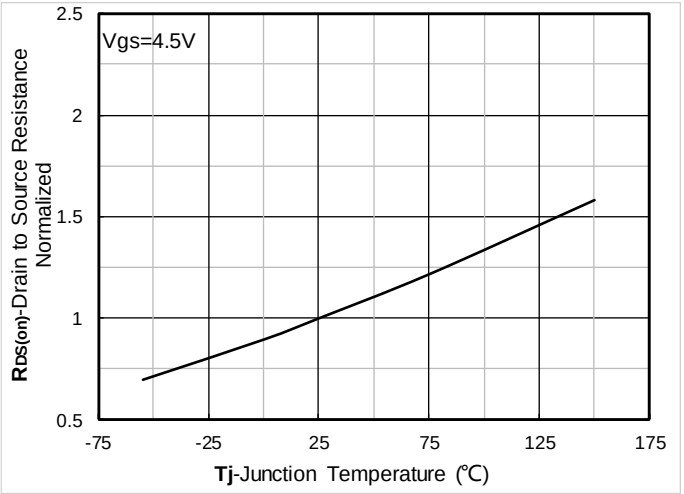


Figure6. Normalized On-Resistance

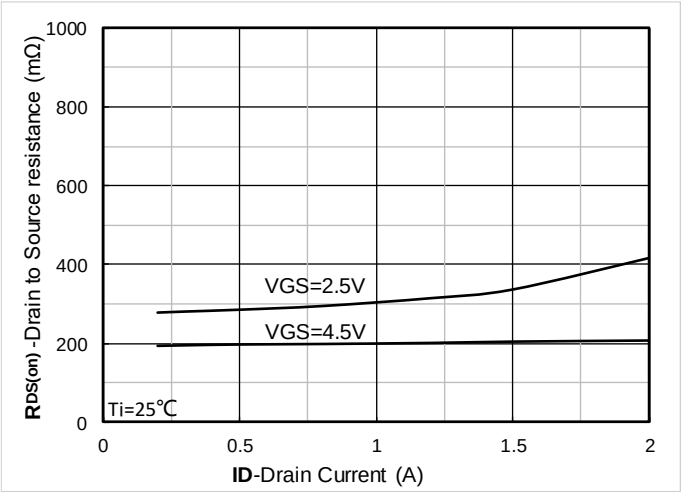


Figure7. $R_{DS(on)}$ VS Drain Current

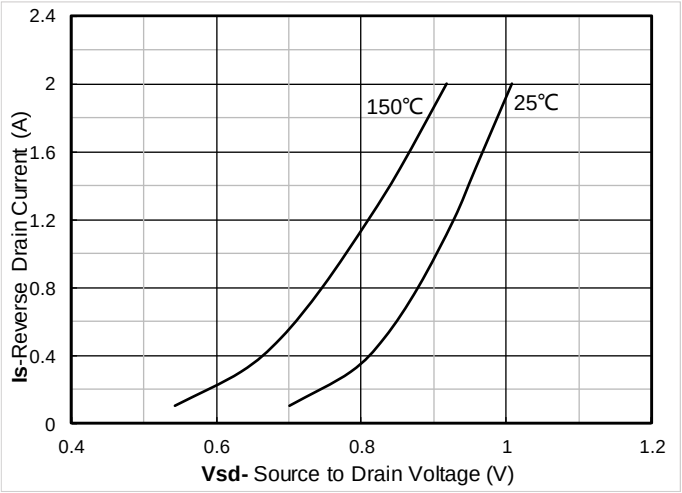


Figure8. Forward characteristics of reverse diode

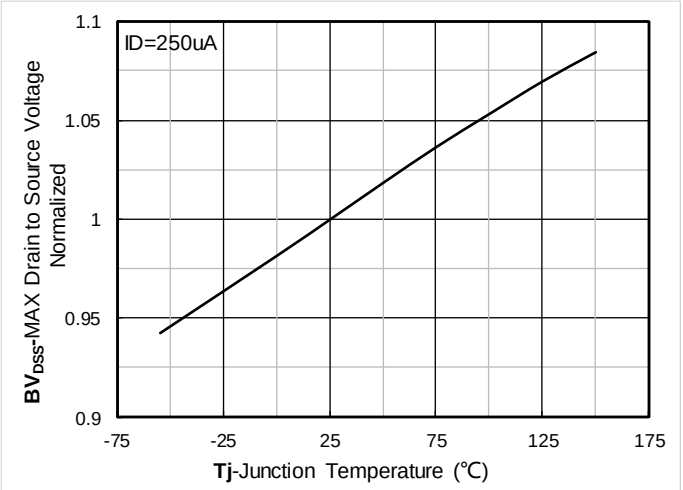


Figure9. Normalized breakdown voltage

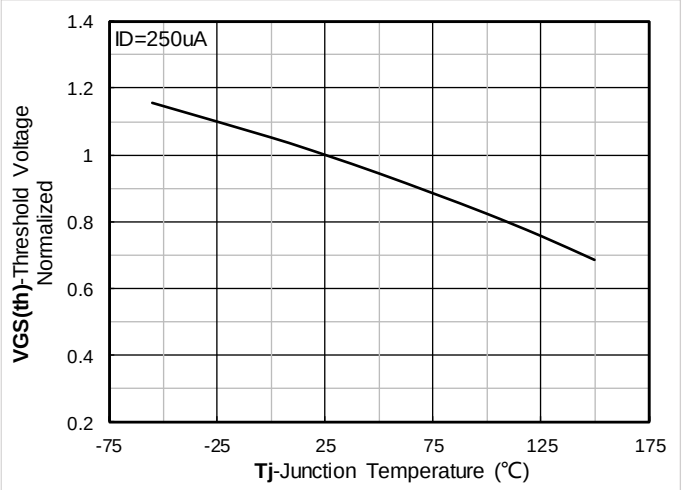


Figure10. Normalized Threshold voltage

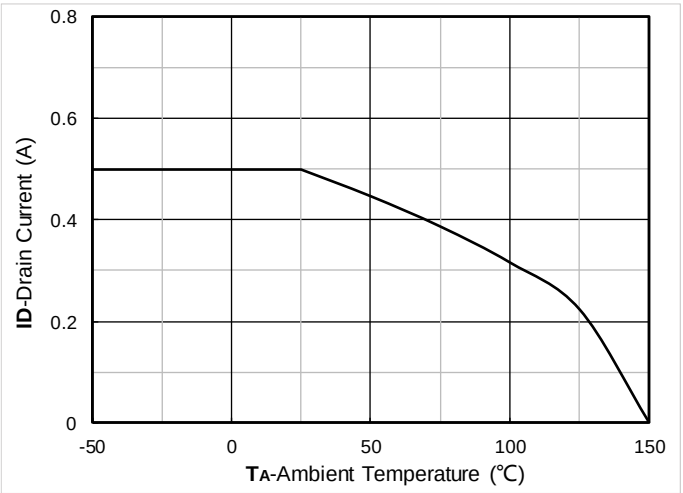


Figure11. Current dissipation

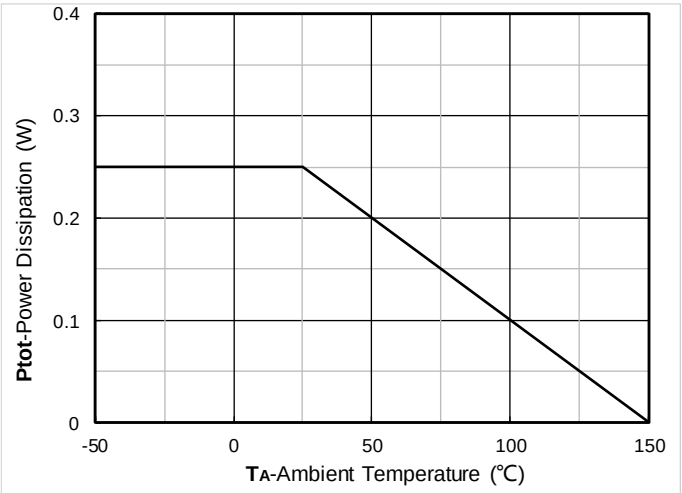


Figure12. Power dissipation

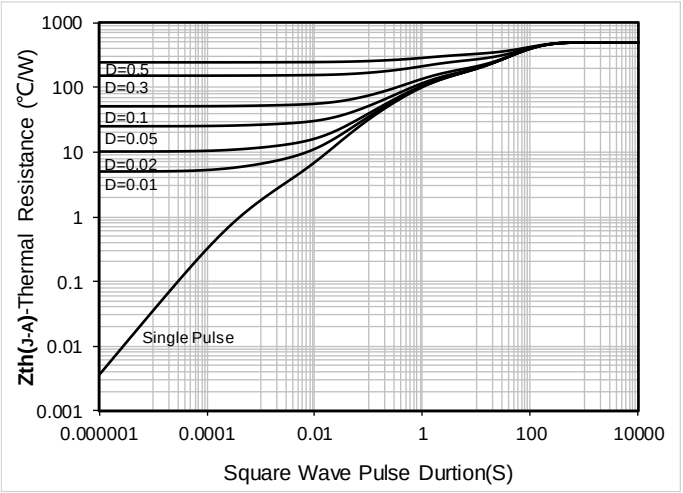


Figure 13. Maximum Transient Thermal Impedance

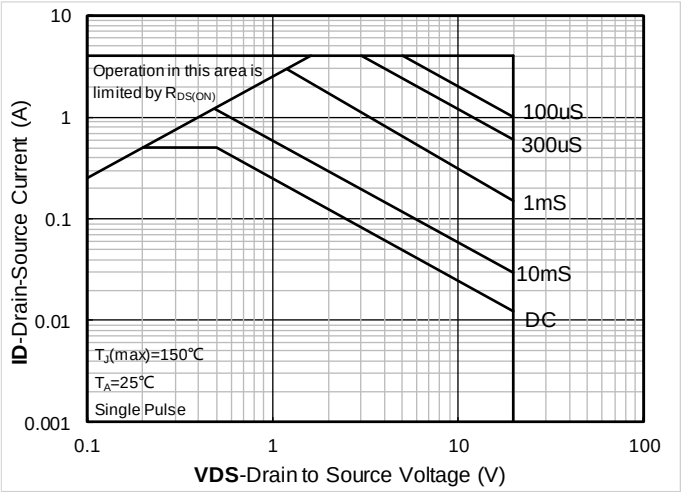
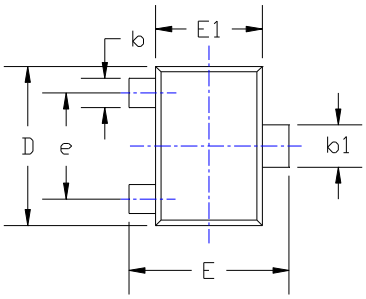
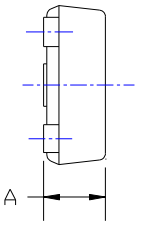


Figure14. Safe Operation Area

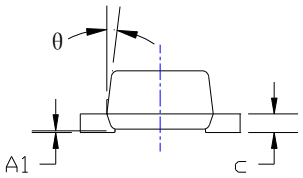
■ SOT-723 Package information



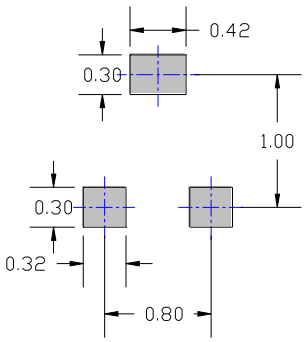
TOP VIEW



SIDE VIEW



SIDE VIEW



SUGGESTED SOLDER PAD LAYOUT

DIMENSIONS				
SYMBOL	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.017	0.022	0.430	0.550
A1	0.000	0.002	0.000	0.050
b	0.007	0.011	0.170	0.270
b1	0.011	0.015	0.270	0.370
c	0.003	0.008	0.080	0.200
D	0.045	0.049	1.150	1.250
E	0.045	0.049	1.150	1.250
E1	0.030	0.033	0.750	0.850
e	0.031TYP.		0.800TYP.	
θ	7°REF.		7°REF.	

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.

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