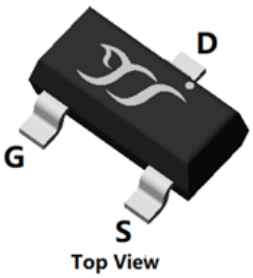
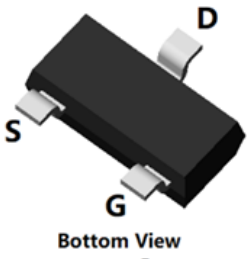
P-Channel Enhancement Mode Field Effect Transistor

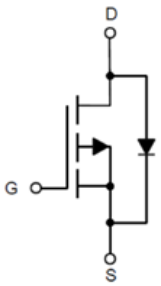


Top View



Bottom View

SOT-23



Product Summary

- V_{DS} -60V
- I_D -0.25A
- $R_{DS(ON)}$(at V_{GS}=-10V) ＜3.6 ohm
- $R_{DS(ON)}$(at V_{GS}=-4.5V) ＜4.5 ohm

General Description

- Trench Power LV MOSFET technology
- Low $R_{DS(ON)}$
- Low Gate Charge
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free
- Part no. with suffix “Q” means AEC-Q101 qualified

Applications

- Video monitor
- Power management
- 12V Automotive systems

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

Parameter		Symbol	Maximum	Unit
Drain-source Voltage		V_{DS}	-60	V
Gate-source Voltage		V_{GS}	±20	V
Drain Current	T_A=25℃ @ Steady State	I_D	-0.25	A
	T_A=100℃ @ Steady State		-0.17	
Pulsed Drain Current [A]		I_{DM}	-0.8	A
Total Power Dissipation [B]	T_A=25℃	P_D	0.6	W
	T_A=100℃		0.3	
Thermal Resistance Junction-to-Ambient [B]		$R_{\theta JA}$	250	℃/ W
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+175	℃

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
BSS84Q	F2	B84.	3000	30000	120000	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	-60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-60V,V_{GS}=0V			-1	μA
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	-0.9	-1.4	-2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= -10V, I_D=-0.15A		2.8	3.6	Ω
		V_{GS}= -4.5V, I_D=-0.15A		3.2	4.5	
Diode Forward Voltage	V_{SD}	I_S=-0.15A,V_{GS}=0V			-1.2	V
Gate resistance	R_G	f=1MHz	-	48	-	Ω
Maximum Body-Diode Continuous Current	I_S				-0.25	A
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=-25V,V_{GS}=0V,f=1MHZ		26		pF
Output Capacitance	C_{oss}			4		
Reverse Transfer Capacitance	C_{rss}			2		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=-10V, V_{DS}=-30V, I_D=-0.25A	-	1.46		nC
Gate Source Charge	Q_{gs}		-	0.27		
Gate Drain Charge	Q_{gd}		-	0.21		
Reverse Recovery Charge	Q_{rr}	I_F=-0.25A, di/dt=100A/us	-	10		
Reverse Recovery Time	t_{rr}		-	20		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=-10V, V_{DD}=-30V, ID=-0.25A R_{GEN}=3Ω	-	2.3		
Turn-on Rise Time	t_r		-	16		
Turn-off Delay Time	$t_{D(off)}$		-	11		
Turn-off Fall Time	t_f		-	28		

A. Pulse Test: Pulse Width≤10us,Duty cycle ≤2%.

B. The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25℃. The maximum allowed junction temperature of 175℃. The value in any given application depends on the user's specific board design.

■ Typical Performance Characteristics

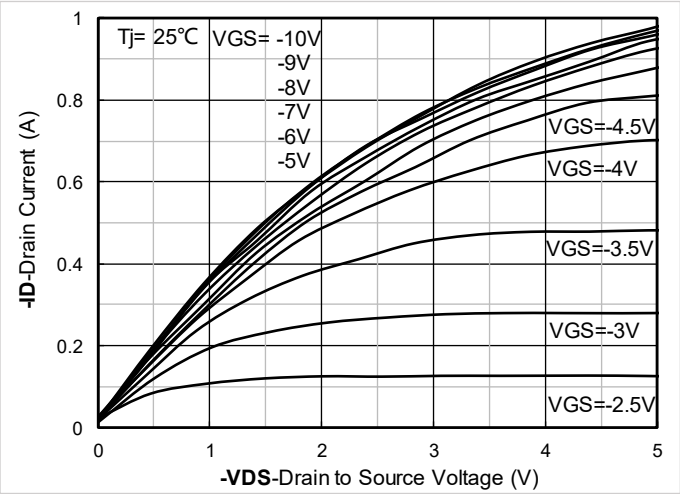


Figure 1. Output Characteristics

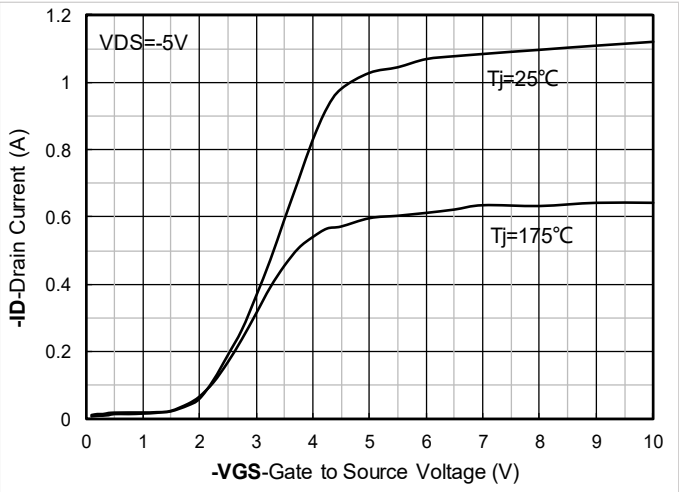


Figure 2. Transfer Characteristics

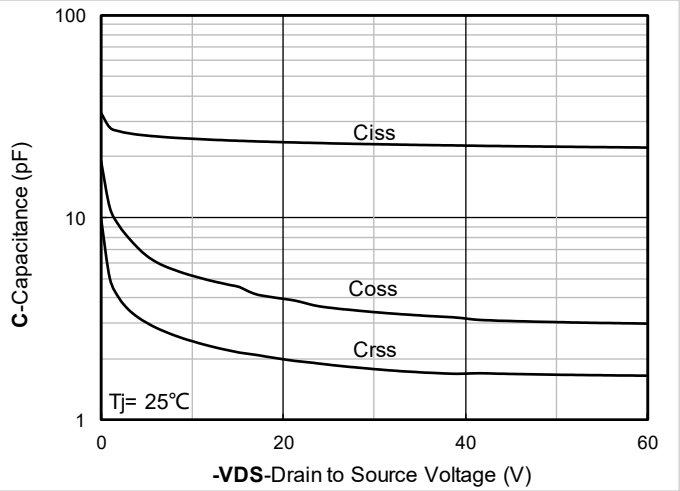


Figure 3. Capacitance Characteristics

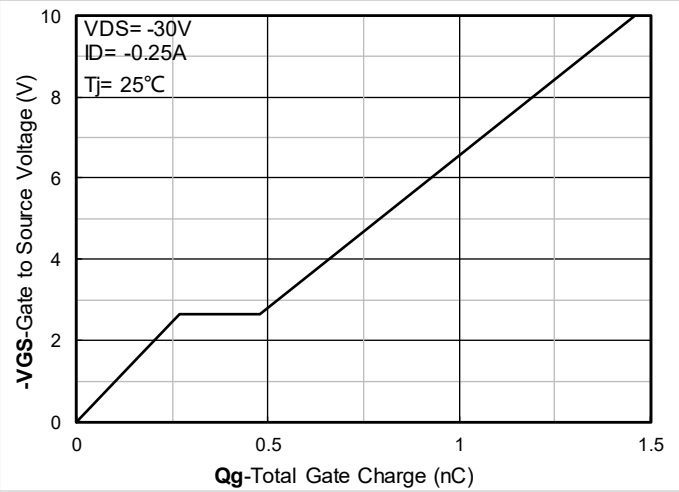


Figure 4. Gate Charge

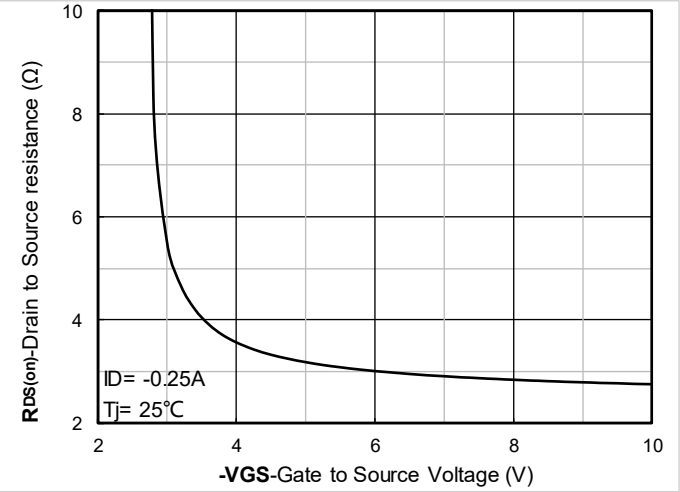


Figure 5. On-Resistance vs Gate to Source Voltage

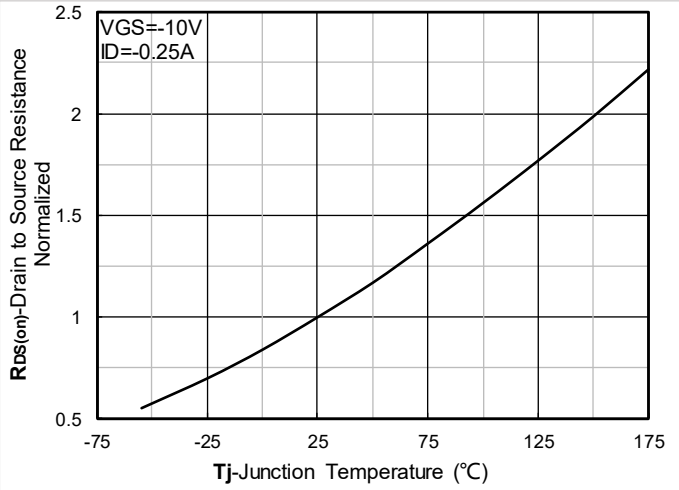


Figure 6. Normalized On-Resistance

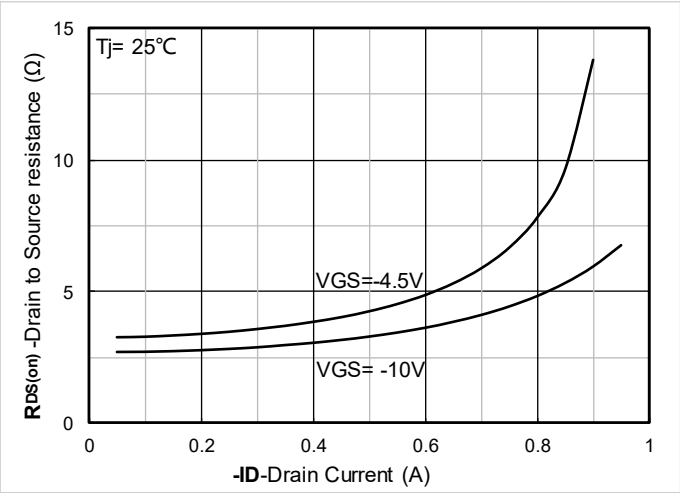


Figure 7. $R_{DS(on)}$ VS Drain Current

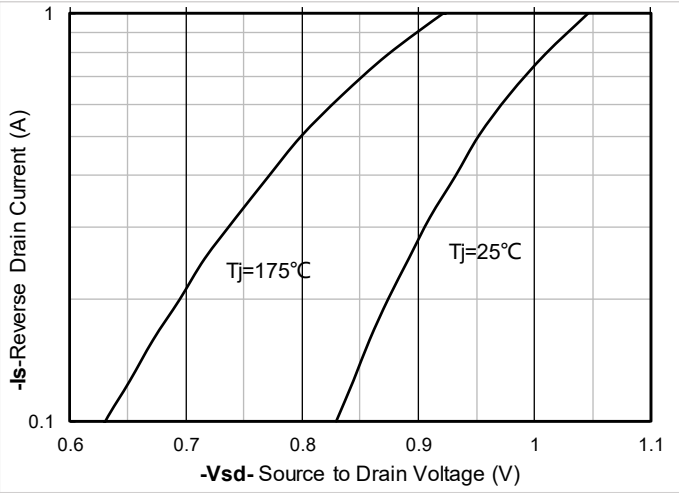


Figure 8. Forward characteristics of reverse diode

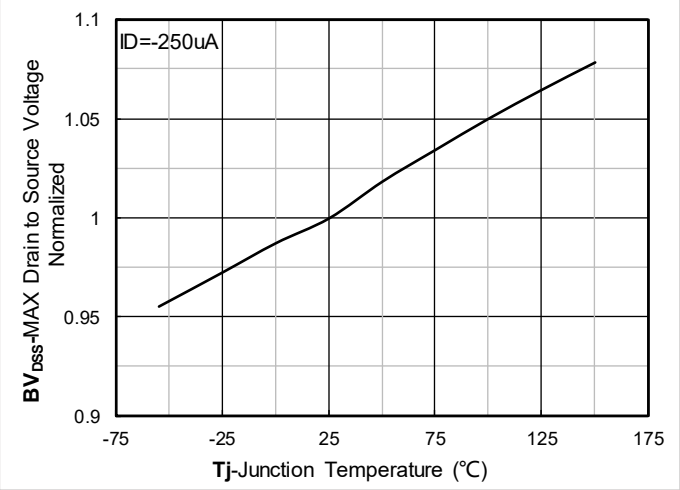


Figure 9. Normalized breakdown voltage

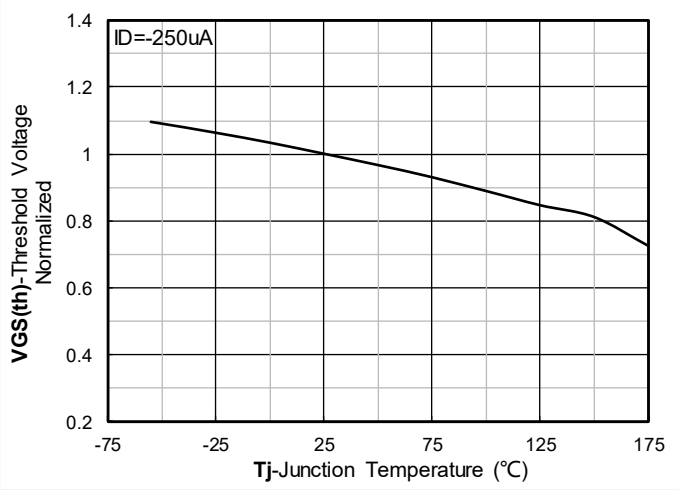


Figure 10. Normalized Threshold voltage

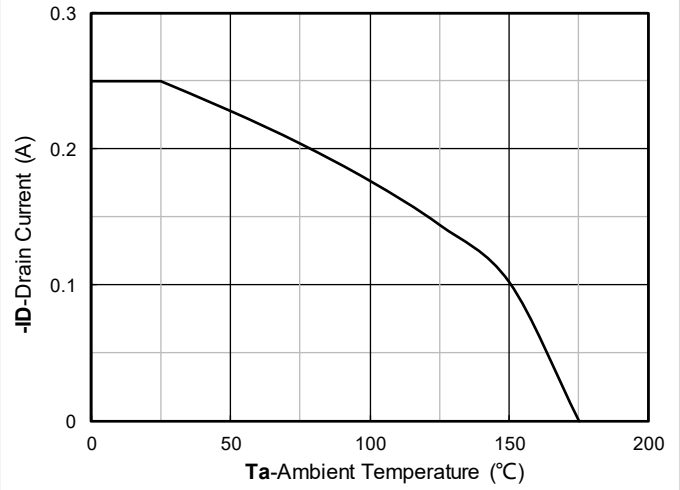


Figure 11. Current dissipation

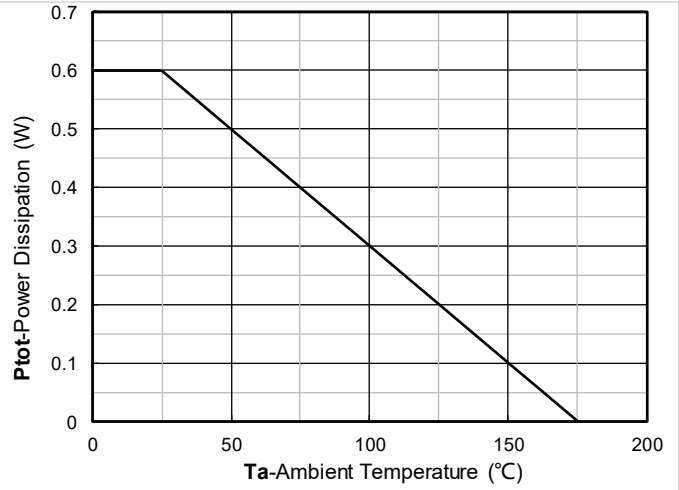


Figure 12. Power dissipation

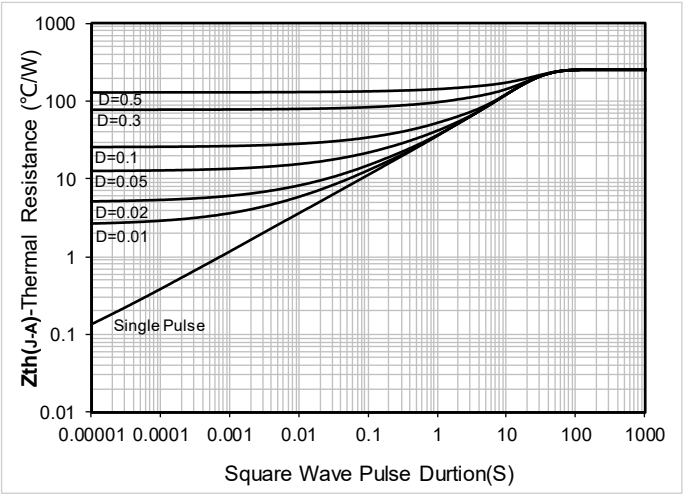


Figure 13. Maximum Transient Thermal Impedance

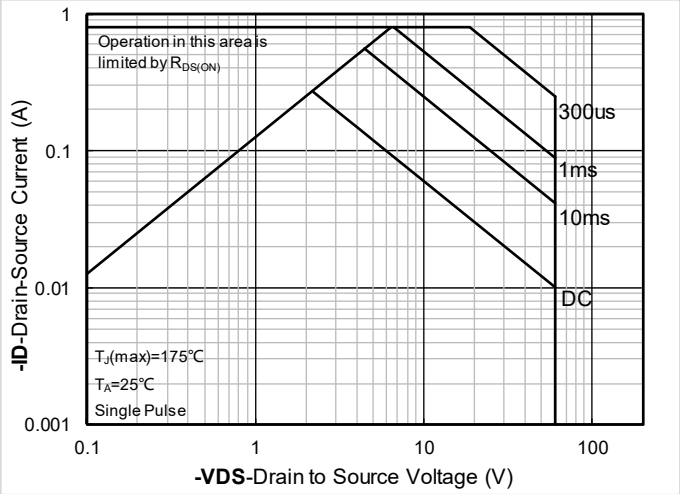
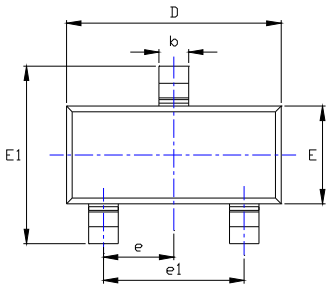
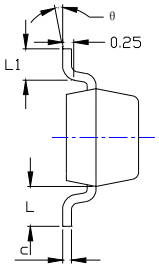


Figure 14. Safe Operation Area

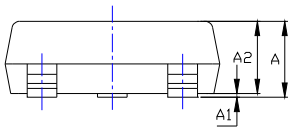
■ SOT-23 Package information



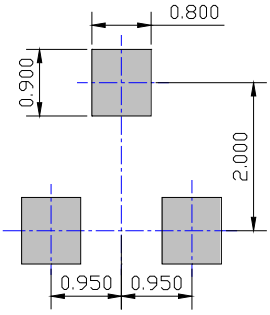
TOP VIEW



SIDE VIEW



SIDE VIEW



UNIT：mm

SUGGESTED SOLDER PAD LAYOUT

DIMENSIONS				
SYMBOL	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.035	0.045	0.900	1.150
A1	0.000	0.004	0.000	0.100
A2	0.035	0.041	0.900	1.050
b	0.012	0.020	0.300	0.500
c	0.004	0.008	0.100	0.200
D	0.110	0.118	2.800	3.000
E	0.047	0.055	1.200	1.400
E1	0.089	0.100	2.250	2.550
e	0.037TYP		0.950TYP	
e1	0.071	0.079	1.800	2.000
L	0.022REF		0.550REF	
L1	0.012	0.020	0.300	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.

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