BSS84EQSB-Q1

P-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-60V	3.4Ω@-10V	-0.25A
	4.7Ω@-4.5V	

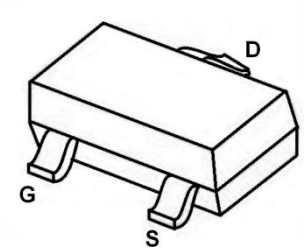
Feature

- Low $R_{DS(on)}$ &FOM
- Extremely low switching loss
- Excellent stability and uniformity
- ESD protected
- Suffix “-Q1” for AEC-Q101

Application

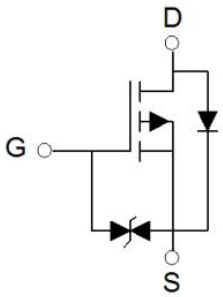
- Power management
- Load switch

Package

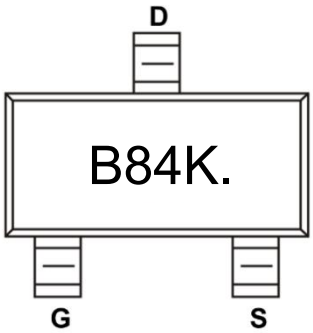


SOT-323

Circuit diagram



Marking



Absolute maximum ratings (T_A=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current[1,2] (V_{GS} =-10V)	I_D	-0.25	A
Continuous Drain Current[1,2] (V_{GS} =-10V, T_A=100℃)	I_D (100℃)	-0.16	A
Pulsed Drain Current (t_p ≤10μs)	I_{DM}	-1.8	A
Power Dissipation[1,2]	P_D	0.39	W
Thermal Resistance Junction to Ambient[2]	$R_{\theta JA}$	320	℃/W
Operating Junction Temperature	T_J	-55 ~ +150	℃
Storage Temperature Range	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_J=25 ºC, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	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_{DS} =0V, V_{GS} =±20V			±10	μA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-1	-1.5	-2.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =-10V, I_D =-0.25A		2	3.4	Ω
		V_{GS} =-4.5V, I_D =-0.2A		2.6	4.7	
Dynamic characteristics[3]						
Input Capacitance	C_{iss}	V_{DS} =-30V, V_{GS} =0V, f =1MHz		36		pF
Output Capacitance	C_{oss}			4.8		
Reverse Transfer Capacitance	C_{rss}			2.5		
Total Gate Charge	Q_g	V_{DS} =-30V, V_{GS} =-10V I_D =-0.4A		1.53		nC
Gate-Source Charge	Q_{gs}			0.17		
Gate-Drain Charge	Q_{gd}			0.23		
Turn-on delay time	$t_{d(on)}$	V_{DS} =-30V, V_{GS} =-10V I_D =-0.4A, R_G =3Ω		5.4		nS
Turn-on rise time	t_r			3.8		
Turn-off delay time	$t_{d(off)}$			32		
Turn-off fall time	t_f			34		
Source-Drain Diode characteristics						
Diode Forward Current	I_S	T_A=25℃			-0.25	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S =-0.25A			-1.2	V
Reverse Recovery Time	T_{rr}	V_{GS} =0V, V_R =-30V I_F =-0.4A, di/dt =-100A/us		15		nS
Reverse Recovery Charge	Q_{rr}			9		nC

Notes:

1) The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.

2) The value of $R_{\theta JA}$ is measured with the device mounted on the 40mm*40mm*1.1mm single layer FR-4 PCB board with 1 in^2 pad of 2oz. Copper, 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.

3) Guaranteed by design, not subject to production testing.

Typical Characteristics

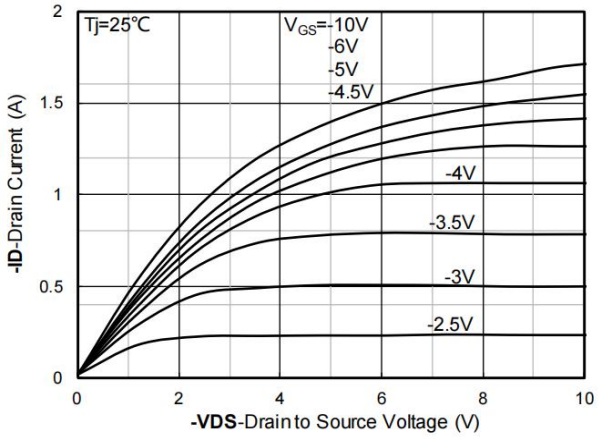


Figure 1. Output Characteristics; typical values

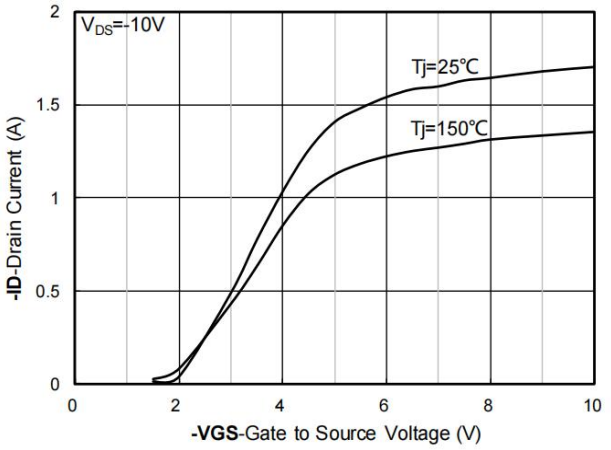


Figure 2. Transfer Characteristics; typical values

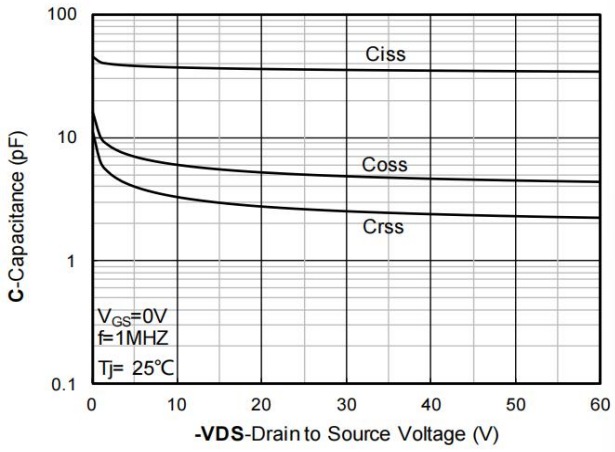


Figure 3. Capacitance Characteristics; typical values

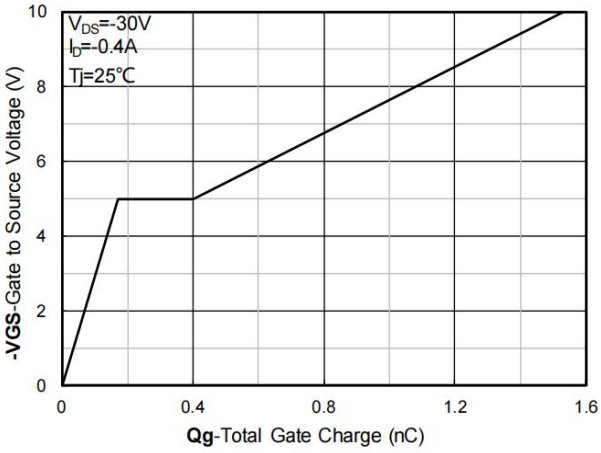


Figure 4. Gate Charge; typical values

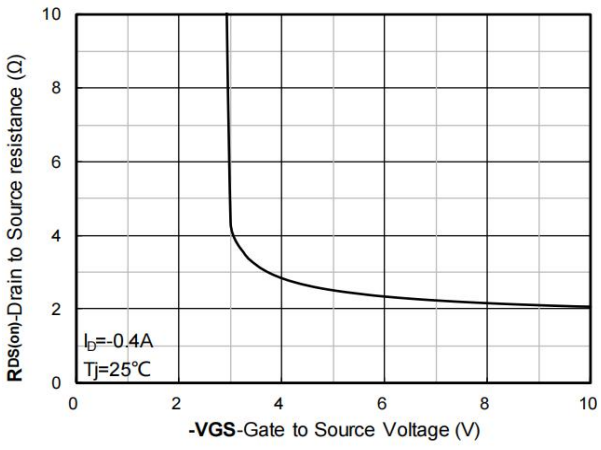


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

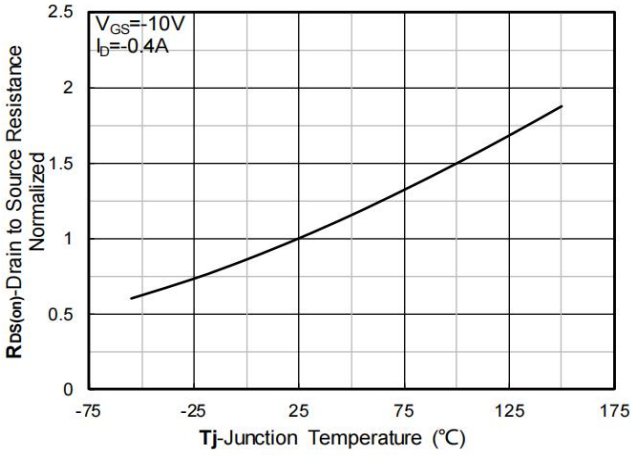


Figure 6. Normalized On-Resistance

Typical Characteristics

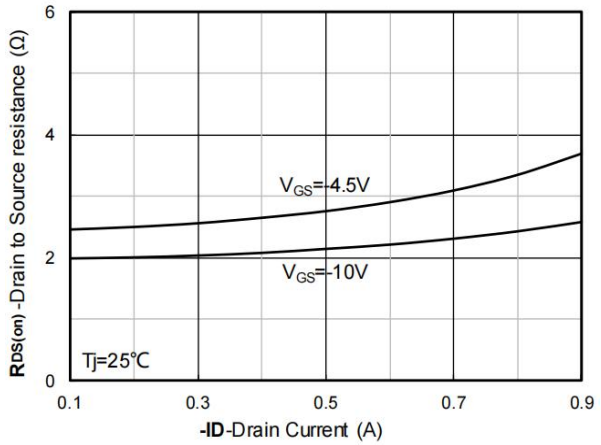


Figure 7. $R_{DS(on)}$ vs. Drain Current; typical values

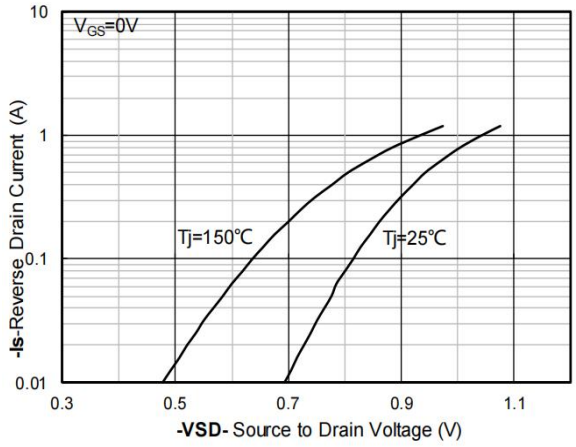


Figure 8. Forward characteristics of reverse diode;

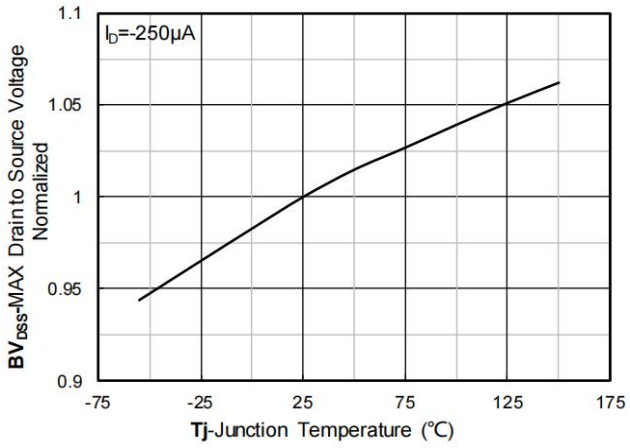


Figure 9. Normalized breakdown voltage

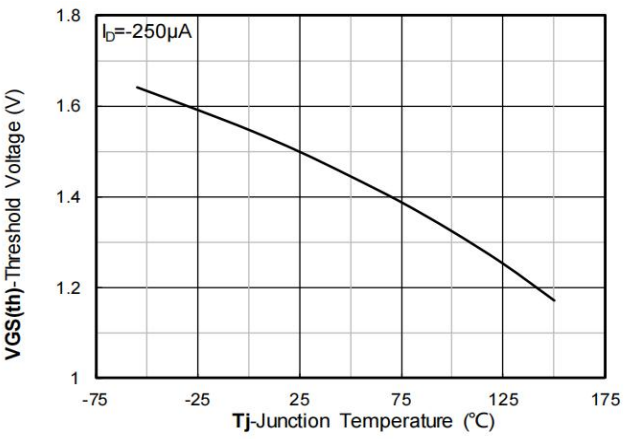


Figure 10. Gate Threshold voltage; typical values

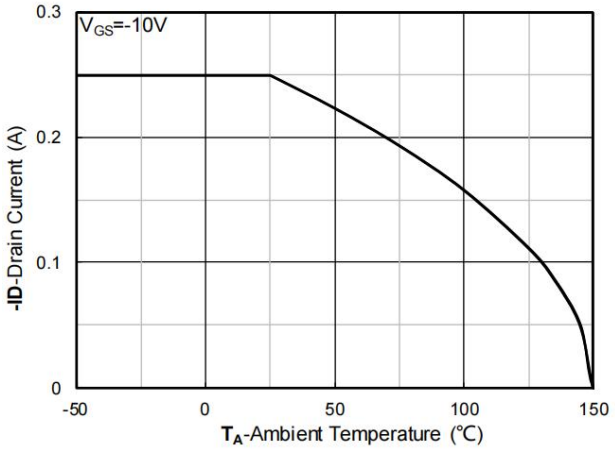


Figure 11. Current dissipation

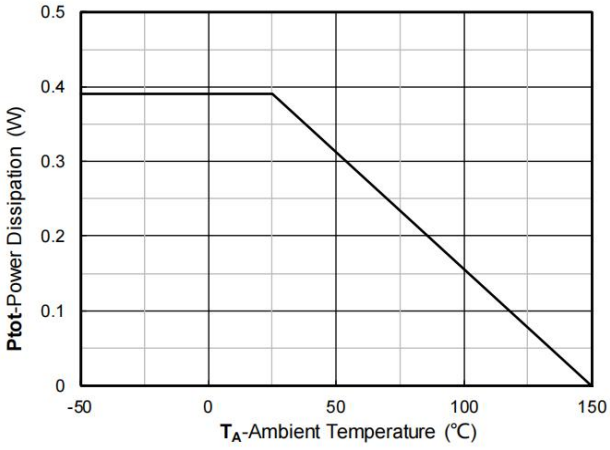


Figure 12. Power dissipation

Typical Characteristics

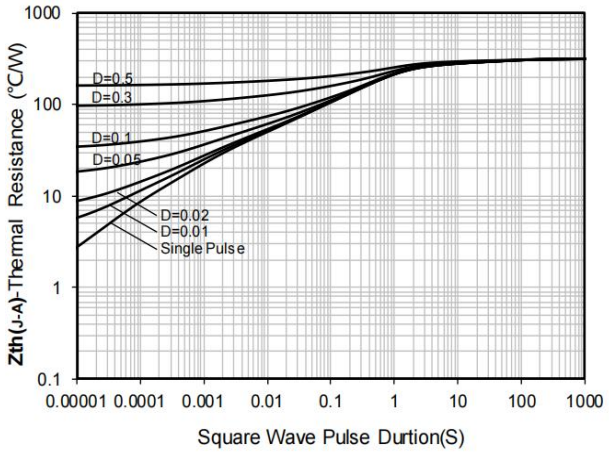


Figure 13. Maximum Transient Thermal Impedance

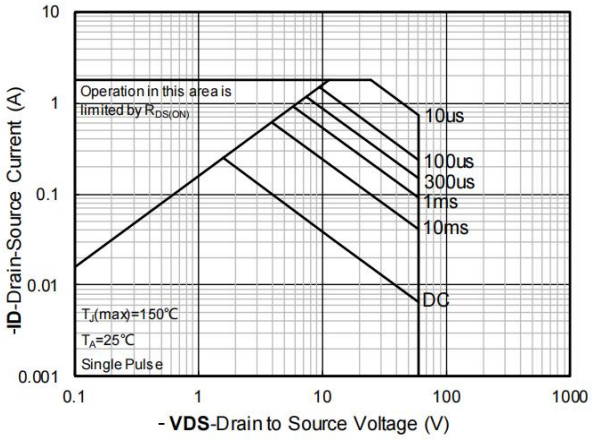
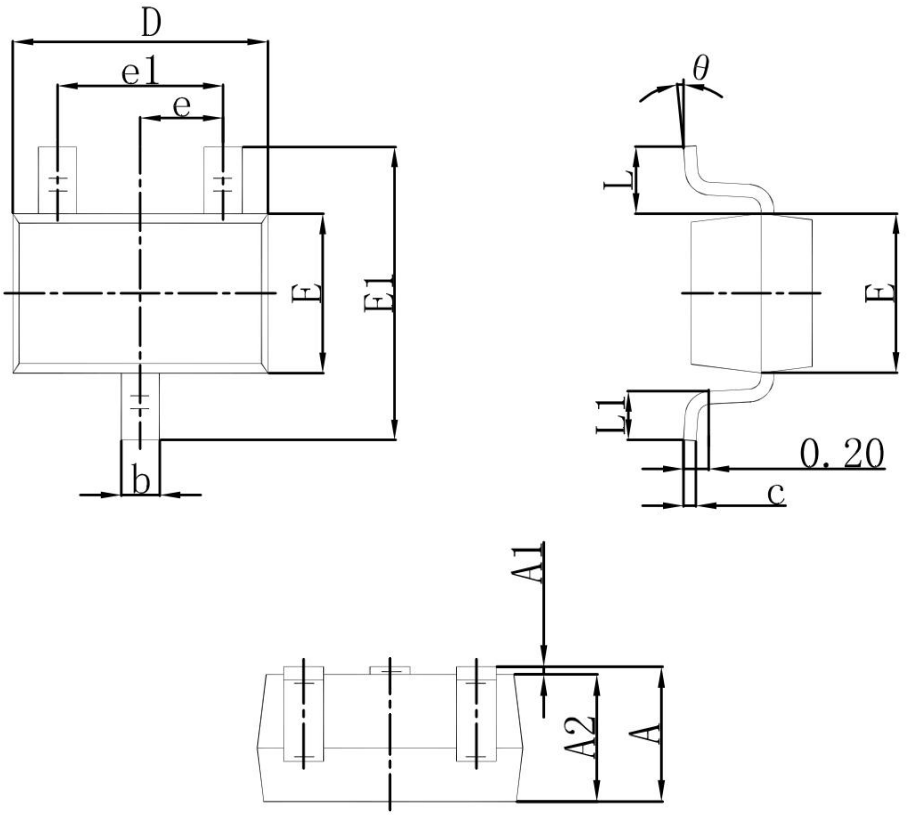


Figure 14. Safe Operation Area

SOT-323 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.400	0.006	0.016
c	0.100	0.250	0.004	0.010
D	1.800	2.200	0.071	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.525 REF.		0.021 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°