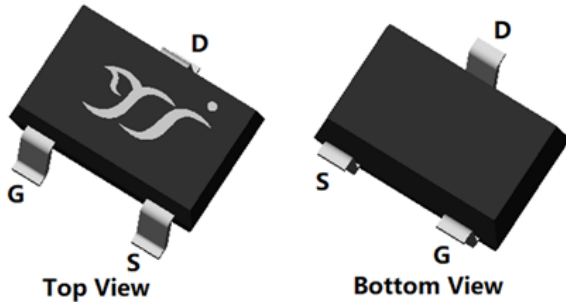


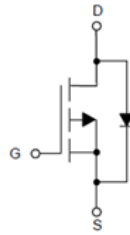
## P-Channel Enhancement Mode Field Effect Transistor



Top View

Bottom View

**SOT-323**



### Product Summary

- $V_{DS}$  -60 V
- $I_D$  -0.19A
- $R_{DS(ON)}$ ( 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 ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Maximum	Unit
Drain-source Voltage	$V_{DS}$	-60	V
Gate-source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current	$I_D$	$T_A=25^\circ\text{C}$ @ Steady State	-0.19
		$T_A=100^\circ\text{C}$ @ Steady State	-0.13
Pulsed Drain Current <sup>A</sup>	$I_{DM}$	-0.8	A
Total Power Dissipation <sup>B</sup>	$P_D$	$T_A=25^\circ\text{C}$	0.29
		$T_A=100^\circ\text{C}$	0.14
Thermal Resistance Junction-to-Ambient <sup>B</sup>	$R_{\theta JA}$	504	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~+175	$^\circ\text{C}$

### ■ Ordering Information

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
BSS84WQ	F2	B84.	3000	30000	120000	7" reel



# BSS84WQ

## ■ Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =-250μA	-60			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-60V, V <sub>GS</sub> =0V			-1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =-250μA	-0.9	-1.4	-2.5	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = -10V, I <sub>D</sub> =-0.15A		3.0	3.6	Ω
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> =-0.15A		3.5	4.5	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-0.17A, V <sub>GS</sub> =0V			-1.2	V
Gate resistance	R <sub>G</sub>	f=1MHz	-	48	-	Ω
<b>Dynamic Parameters</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-25V, V <sub>GS</sub> =0V, f=1MHz		26		pF
Output Capacitance	C <sub>oss</sub>			4		
Reverse Transfer Capacitance	C <sub>rss</sub>			2		
<b>Switching Parameters</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-30V, I <sub>D</sub> =-0.19A	-	1.46		nC
Gate Source Charge	Q <sub>gs</sub>			0.27		
Gate Drain Charge	Q <sub>gd</sub>			0.21		
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =-0.19A, di/dt=100A/us	-	10		
Reverse Recovery Time	t <sub>rr</sub>			20		
Turn-on Delay Time	t <sub>D(on)</sub>	V <sub>GS</sub> =-10V, V <sub>DD</sub> =-30V, I <sub>D</sub> =-0.19A R <sub>GEN</sub> =3Ω	-	2.3		ns
Turn-on Rise Time	t <sub>r</sub>			16		
Turn-off Delay Time	t <sub>D(off)</sub>			11		
Turn-off Fall Time	t <sub>f</sub>			28		

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

B. The value of R<sub>θJA</sub> is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub> = 25°C. The maximum allowed junction temperature of 175°C. The value in any given application depends on the user's specific board design.



## ■ Typical Performance Characteristics

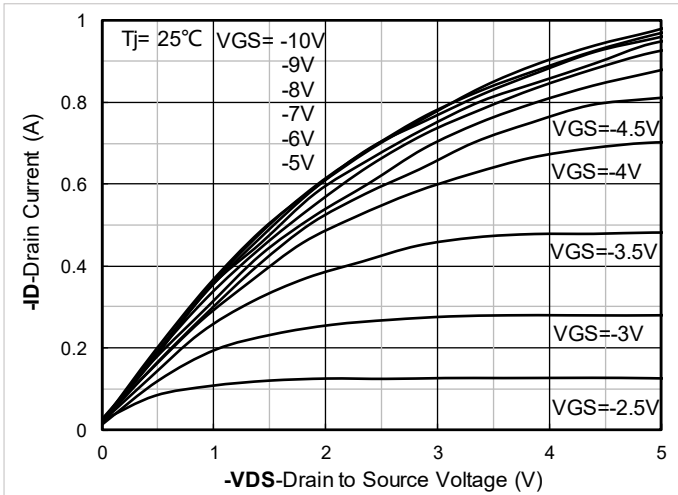


Figure 1. Output Characteristics

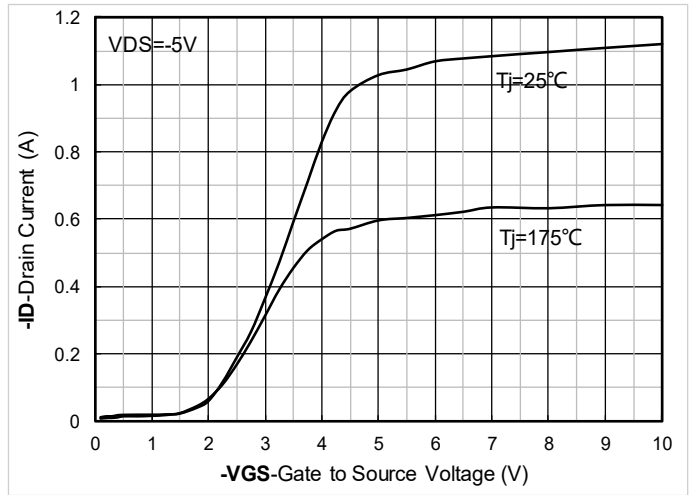


Figure 2. Transfer Characteristics

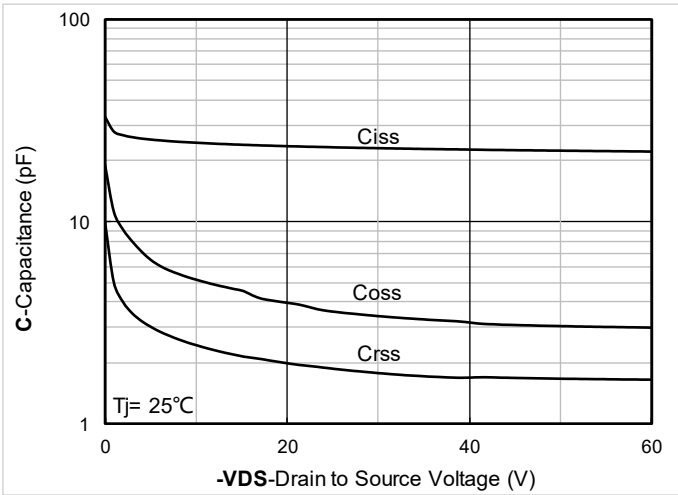


Figure 3. Capacitance Characteristics

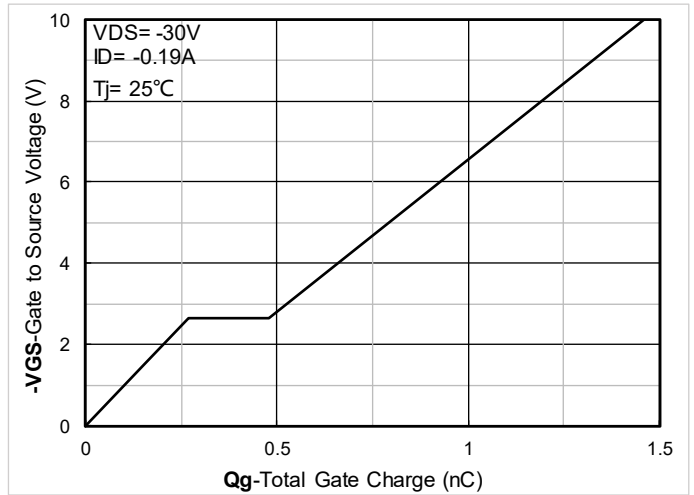


Figure 4. Gate Charge

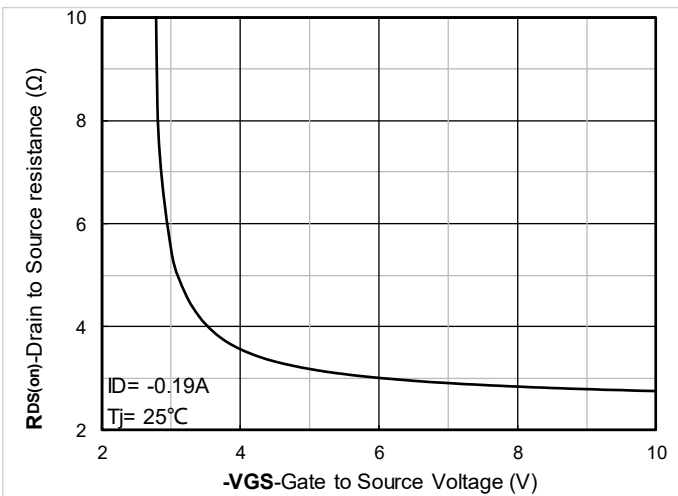


Figure 5. On-Resistance vs Gate to Source Voltage

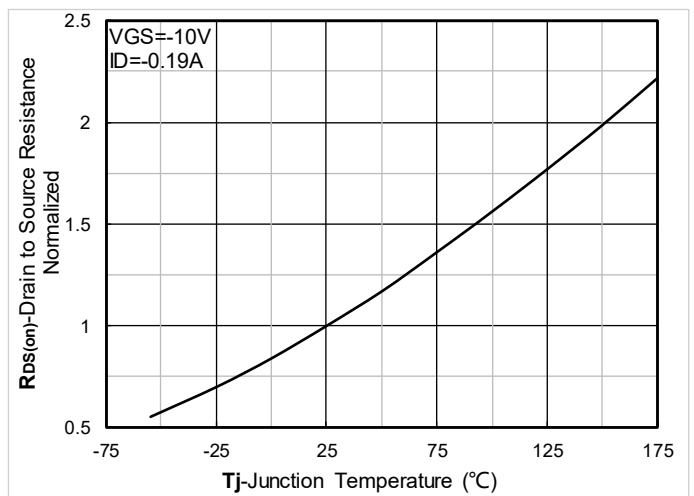


Figure 6. Normalized On-Resistance



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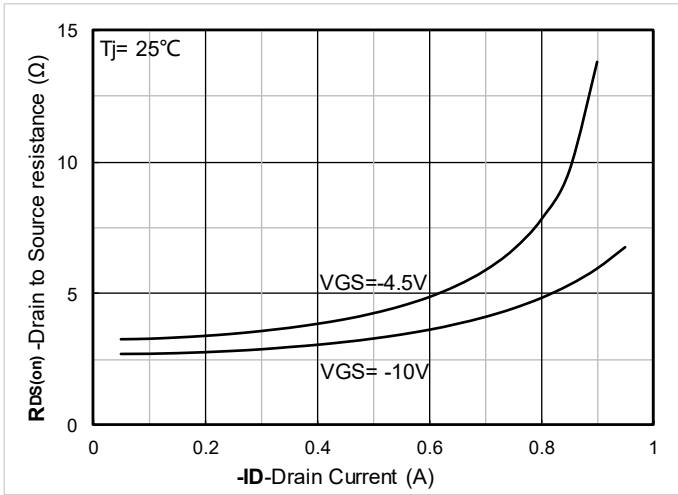


Figure 7. RDS(on) VS Drain Current

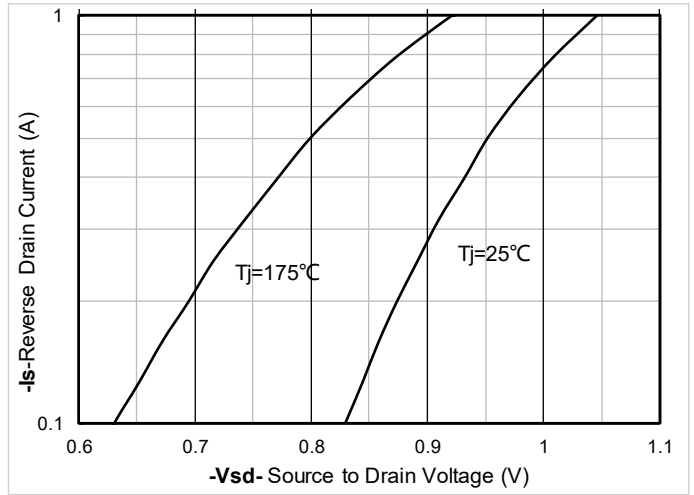


Figure 8. Forward characteristics of reverse diode

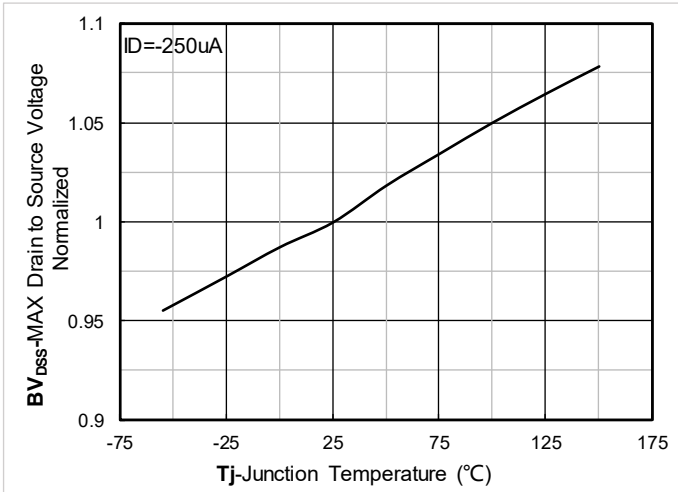


Figure 9. Normalized breakdown voltage

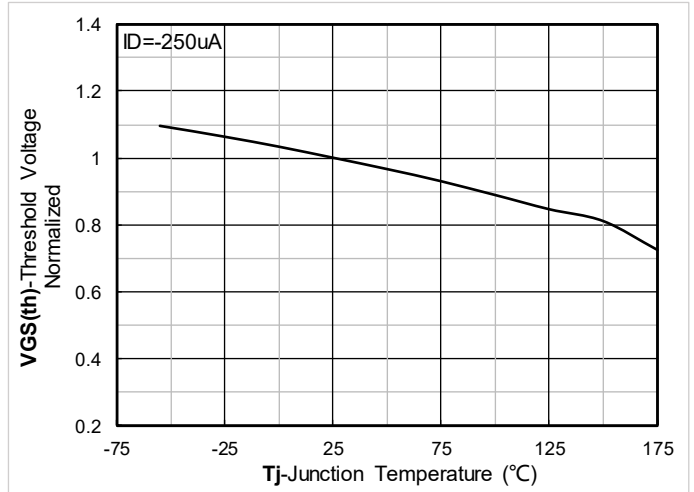


Figure 10. Normalized Threshold voltage

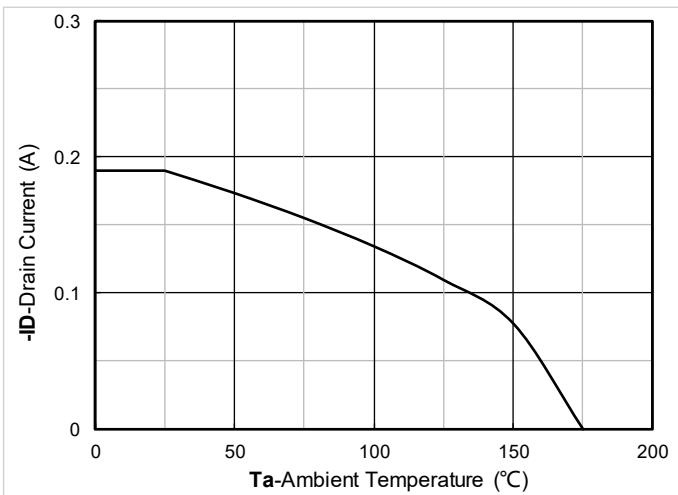


Figure 11. Current dissipation

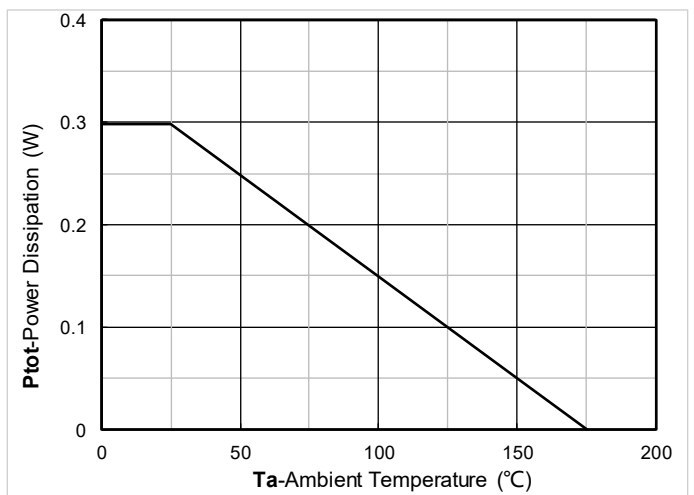


Figure 12. Power dissipation



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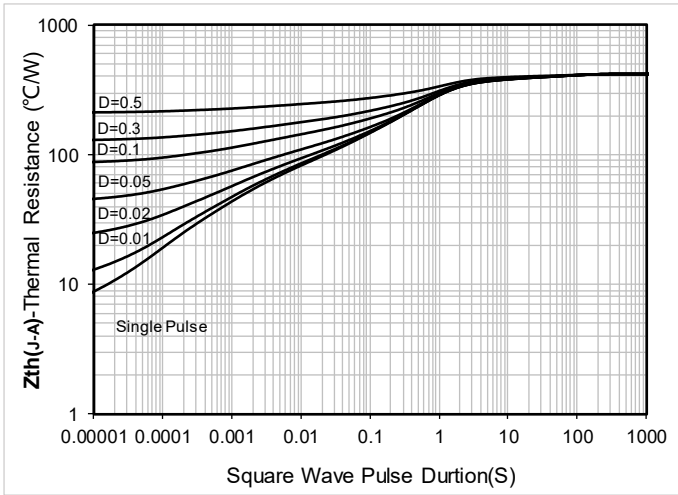


Figure 13. Maximum Transient Thermal Impedance

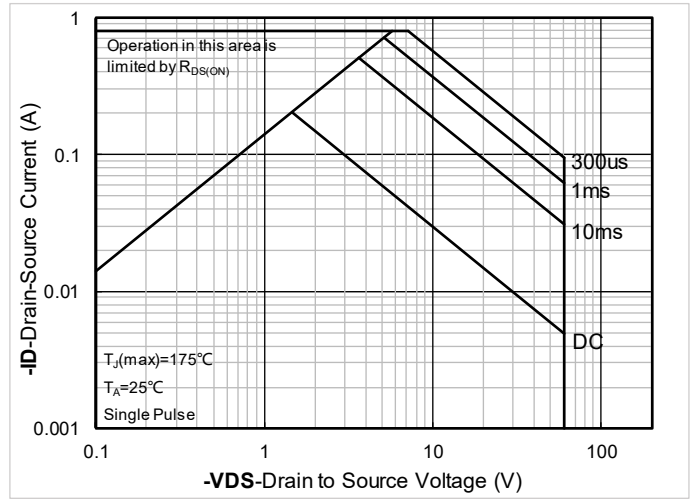
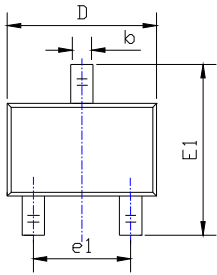


Figure 14. Safe Operation Area

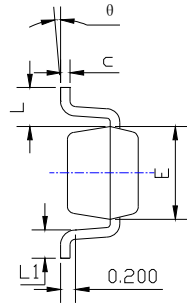


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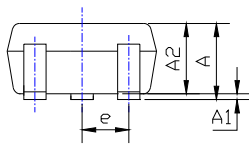
## ■ SOT-323 Package Information



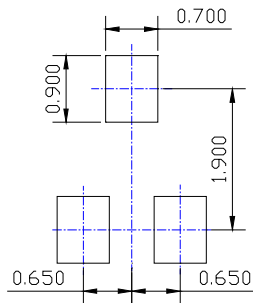
TOP VIEW



SIDE VIEW



SIDE VIEW



UNIT: mm

SUGGESTED SOLDER PAD LAYOUT

SYMBOL	DIMENSIONS			
	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.035	0.043	0.900	1.100
A1	0.000	0.004	0.000	0.100
A2	0.035	0.039	0.900	1.000
b	0.006	0.016	0.150	0.400
c	0.004	0.010	0.100	0.250
D	0.071	0.087	1.800	2.200
E	0.045	0.053	1.150	1.350
E1	0.085	0.096	2.150	2.450
e	0.026 TYP		0.650 TYP	
e1	0.047	0.055	1.200	1.400
L	0.021 REF		0.525 REF	
L1	0.010	0.018	0.260	0.460
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.



## BSS84WQ

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