

Product Summary

BV_{DS}	$R_{DS(ON)}$ max	I_D $T_A = +25^\circ\text{C}$
-50V	10 Ω @ $V_{GS} = -5\text{V}$	-130mA

Description

This MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

- General Purpose Interfacing Switch
- Power Management Functions
- Analog Switch

Features and Benefits

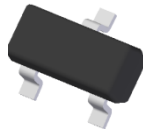
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**
- The BSS84Q is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

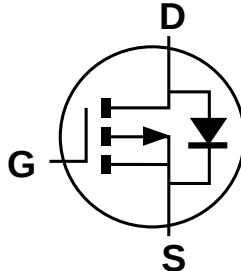
Mechanical Data

- Case: SOT23
- Case Material: UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish (Lead Free Plating) Solderable per MIL-STD-202, Method 208 **e3**
- Terminal Connections: See Diagram
- Weight: 0.009 grams (Approximate)

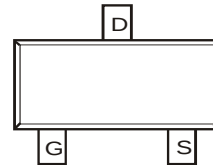
SOT23



Top View



Equivalent Circuit



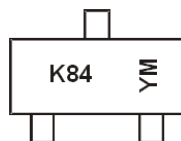
Top View

Ordering Information (Note 4)

Part Number	Qualification	Case	Packaging
BSS84-7-F	Commercial	SOT23	3000/Tape & Reel
BSS84Q-7-F	Automotive	SOT23	3000/Tape & Reel
BSS84-13-F	Commercial	SOT23	10000/Tape & Reel
BSS84Q-13-F	Automotive	SOT23	10000/Tape & Reel

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 - See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 - For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



K84 = Product Type Marking Code
YM or YM = Date Code Marking
Y or Y = Year (ex: G = 2019)
M = Month (ex: 9 = September)

Date Code Key

Year	1998	~	2016	2017	2018	2019	2020	2021	2022	2023
Code	J	~	D	E	F	G	H	I	J	K

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	-50	V
Drain-Gate Voltage R _{GS} ≤ 20kΩ	V _{DGR}	-50	V
Gate-Source Voltage	V _{GSS}	±20	V
Drain Current (Note 5)	I _D	-130	mA
Pulsed Drain Current	I _{DM}	-1.2	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	300	mW
Thermal Resistance, Junction to Ambient	R _{θJA}	417	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
Drain-Source Breakdown Voltage	BV _{DSS}	-50	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	μA	V _{DS} = -50V, V _{GS} = 0V, T _J = +25°C
		—	—	-2	μA	V _{DS} = -50V, V _{GS} = 0V, T _J = +125°C
		—	—	-100	nA	V _{DS} = -25V, V _{GS} = 0V, T _J = +25°C
Gate-Body Leakage	I _{GSS}	—	—	±10	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	V _{GS(TH)}	-0.8	—	-2.0	V	V _{DS} = V _{GS} , I _D = -1mA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	—	10	Ω	V _{GS} = -5V, I _D = -0.100A
Forward Transconductance	g _{FS}	0.05	—	—	S	V _{DS} = -25V, I _D = -0.1A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C _{iss}	—	24.6	45	pF	V _{DS} = -25V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	4.7	25	pF	
Reverse Transfer Capacitance	C _{rss}	—	2.8	12	pF	
Gate Resistance	R _g	—	916	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = -4.5V)	Q _g	—	0.28	—	nC	V _{DS} = -10V, I _D = -0.1A
Total Gate Charge (V _{GS} = -10V)	Q _g	—	0.59	—	nC	
Gate-Source Charge	Q _{gs}	—	0.09	—	nC	
Gate-Drain Charge	Q _{gd}	—	0.08	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	10	—	ns	V _{DD} = -30V, I _D = -0.27A, R _{GEN} = 50Ω, V _{GS} = -10V
Turn-Off Delay Time	t _{D(OFF)}	—	18	—	ns	

- Notes:
- Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown in Diodes Incorporated's package outline PDFs, which can be found on our website at <http://www.diodes.com/package-outlines.html>.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

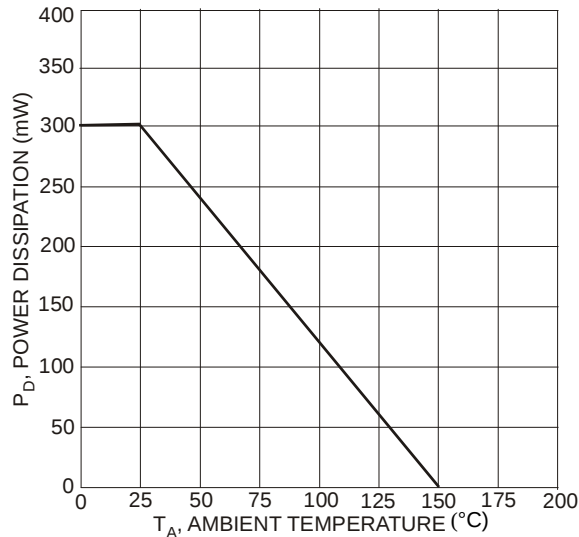


Fig. 1 Max Power Dissipation vs. Ambient Temperature

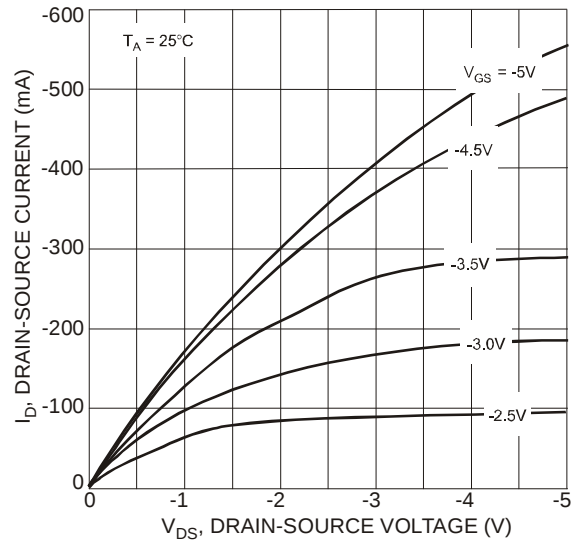


Fig. 2 Drain-Source Current vs. Drain-Source Voltage

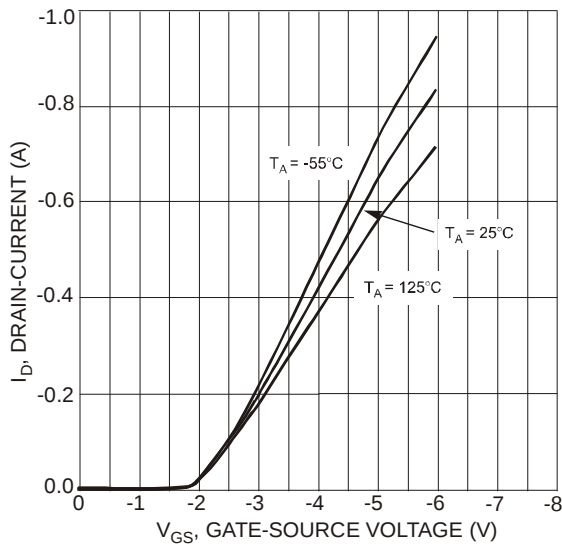


Fig. 3 Drain-Current vs. Gate-Source Voltage

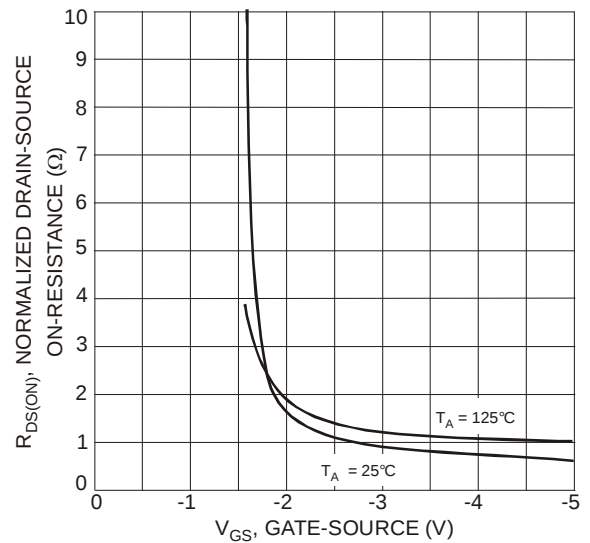


Fig. 4 On-Resistance vs. Gate-Source Voltage

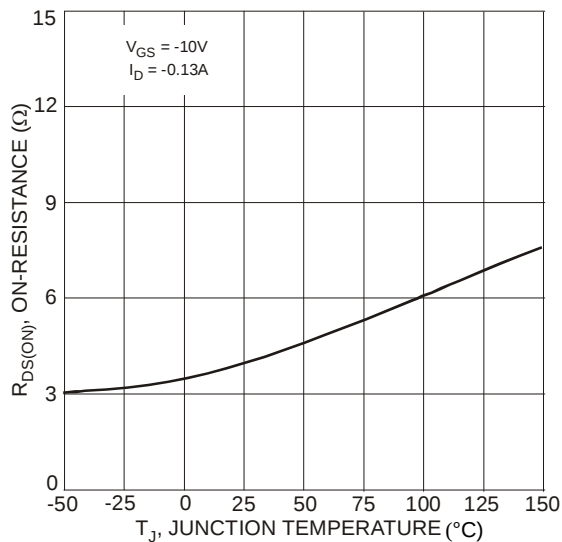


Fig. 5 On-Resistance vs. Junction Temperature

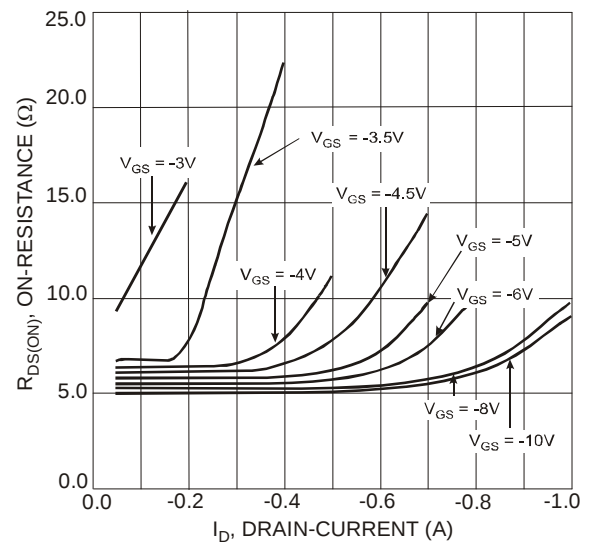
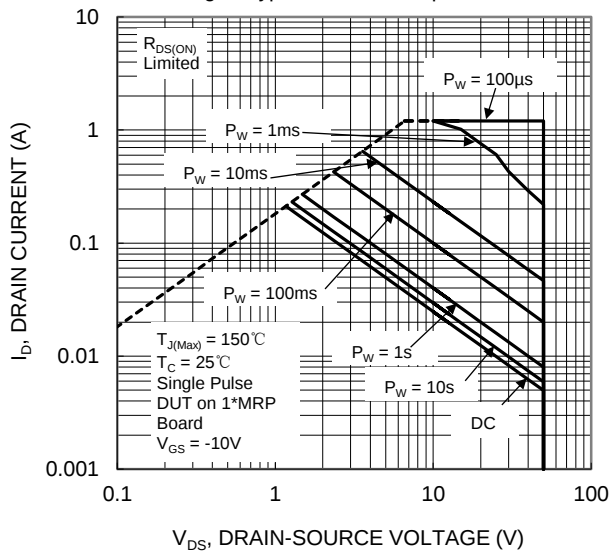
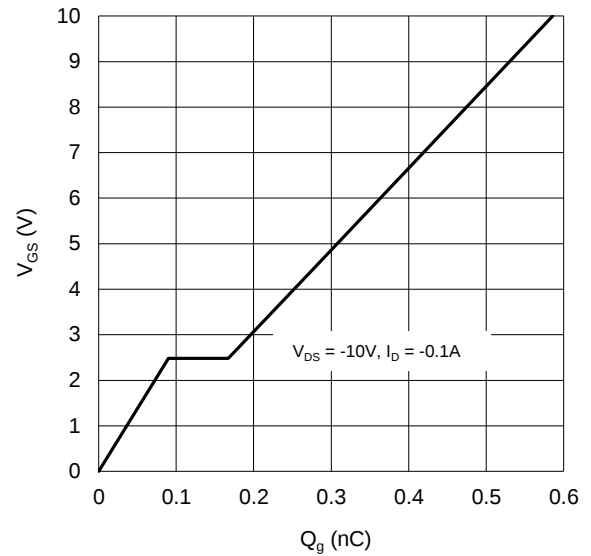
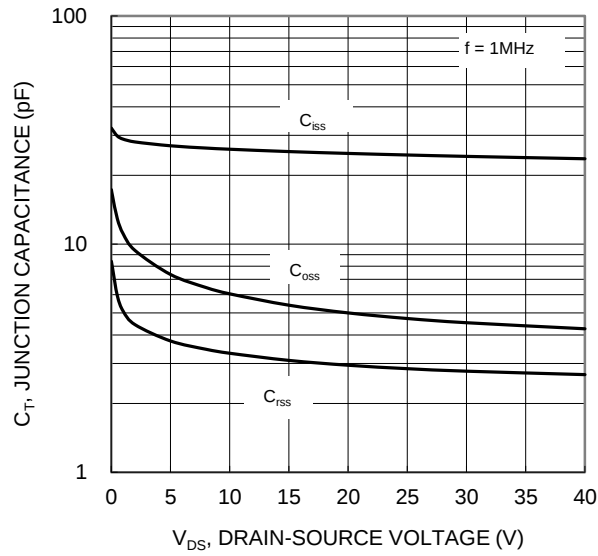


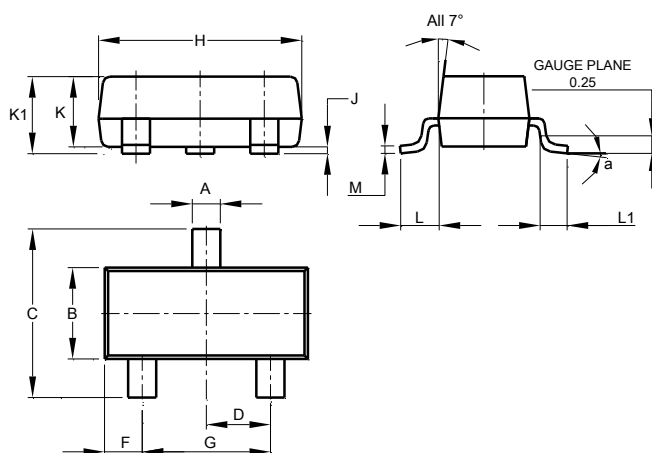
Fig. 6 On-Resistance vs. Drain-Current



Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT23

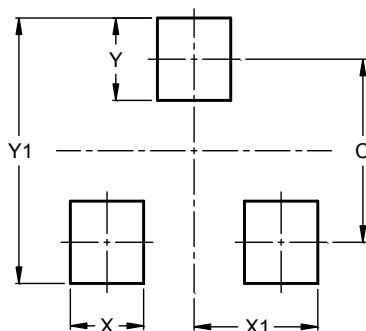


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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