

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on) \text{ max}}$	$I_D$ $T_A = +25^\circ\text{C}$
-50V	10 $\Omega$ @ $V_{GS} = -5V$	-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

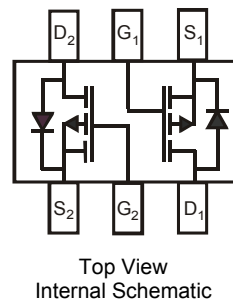
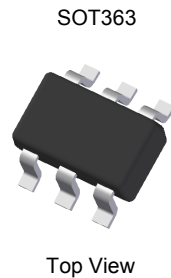
- General Purpose Interfacing Switch
- Power Management Functions
- Analog Switch

## Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

- Case: SOT363
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Alloy 42 leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208 <sup>(3)</sup>
- Terminal Connections: See Diagram
- Weight: 0.006 grams (approximate)

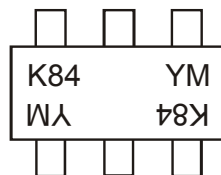


## Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging
BSS84DW-7-F	Standard	SOT363	3,000/Tape & Reel
BSS84DWQ-13	Automotive	SOT363	10,000/Tape & Reel
BSS84DWQ-7	Automotive	SOT363	3,000/Tape & Reel

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

## Marking Information



K84 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: N = 2002)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Code	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z

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** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Units
Drain-Source Voltage	$V_{DSS}$	-50	V
Drain-Gate Voltage (Note 5)	$V_{DGR}$	-50	V
Gate-Source Voltage	Continuous $V_{GSS}$	$\pm 20$	V
Drain Current (Note 6)	Continuous $I_D$	-130	mA

**Thermal Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 6)	$P_D$	300	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	-50	-75	—	V	$V_{GS} = 0V, I_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	-1	$\mu\text{A}$	$V_{DS} = -50V, V_{GS} = 0V, T_J = +25^\circ\text{C}$
		—	—	-100	nA	$V_{DS} = -25V, V_{GS} = 0V, T_J = +25^\circ\text{C}$
Gate-Body Leakage	$I_{GSS}$	—	—	$\pm 10$	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	-0.8	-1.6	-2.0	V	$V_{DS} = V_{GS}, I_D = -1\text{mA}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	6	10	$\Omega$	$V_{GS} = -5V, I_D = -0.100\text{A}$
Forward Transconductance	$g_{FS}$	0.05	—	—	S	$V_{DS} = -25V, I_D = -0.1\text{A}$
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	$C_{iss}$	—	—	45	pF	$V_{DS} = -25V, V_{GS} = 0V, f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	—	25	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	—	12	pF	
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Delay Time	$t_{D(ON)}$	—	10	—	ns	$V_{DD} = -30V, I_D = -0.27\text{A}$
Turn-Off Delay Time	$t_{D(OFF)}$	—	18	—	ns	$R_{GEN} = 50\Omega, V_{GS} = -10V$

- Notes:
- $R_{GS} \leq 20\text{K}\Omega$ .
  - Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com>.
  - Short duration pulse test used to minimize self-heating effect.

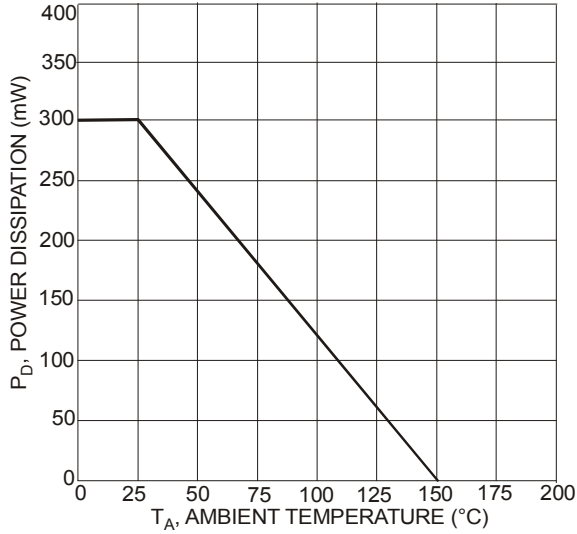


Fig. 1 Max Power Dissipation vs. Ambient Temperature

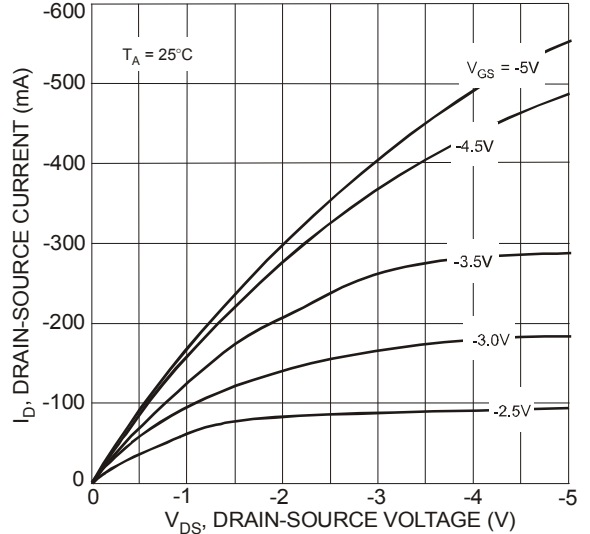


Fig. 2 Drain-Source Current vs. Drain-Source Voltage

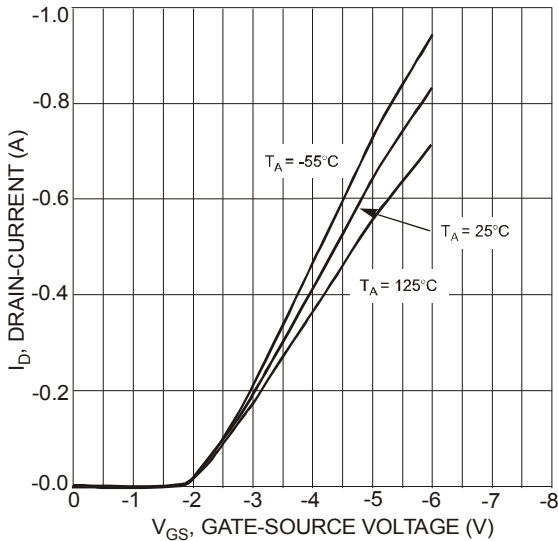


Fig. 3 Drain-Current vs. Gate-Source Voltage

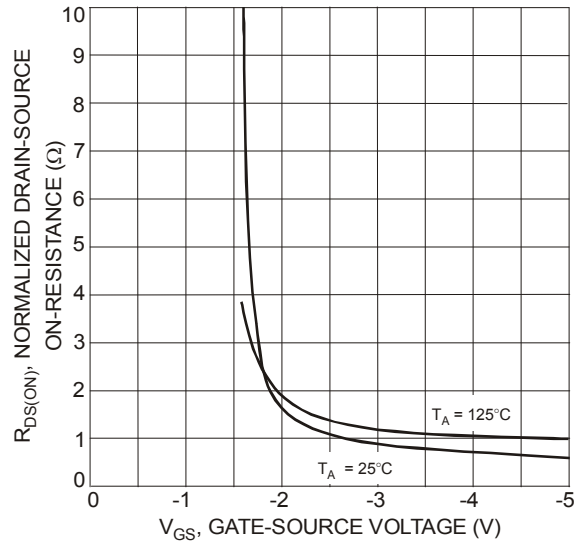


Fig. 4 On-Resistance vs. Gate-Source Voltage

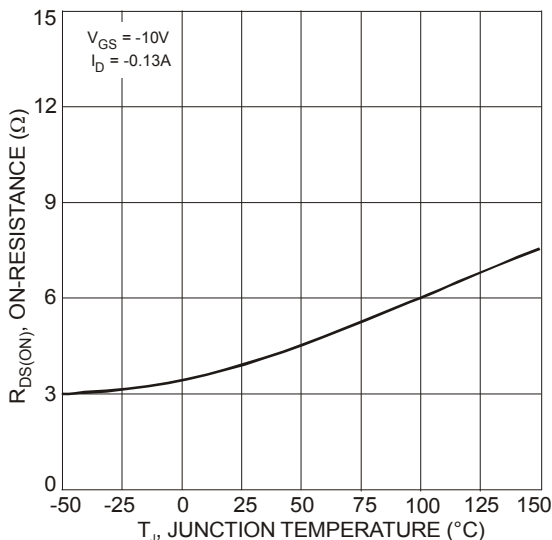


Fig. 5 On-Resistance vs. Junction Temperature

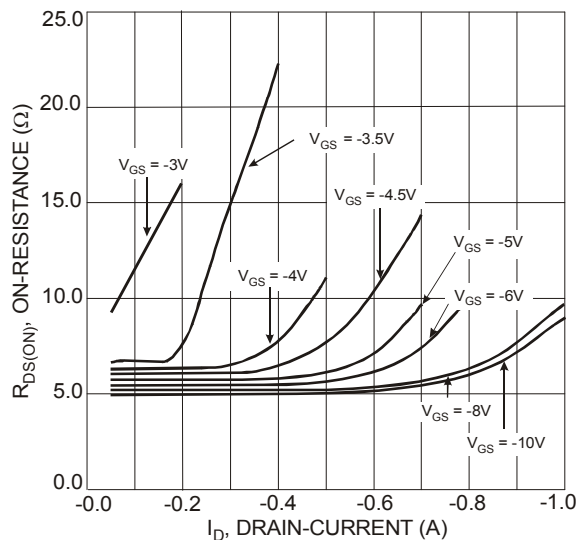
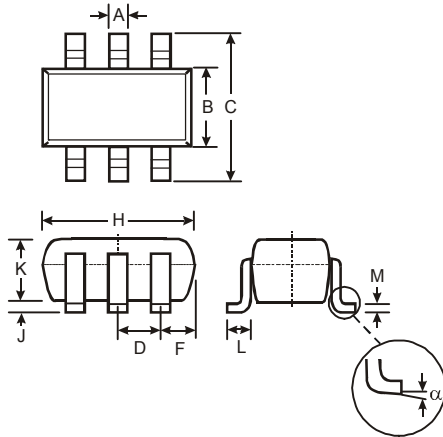


Fig. 6 On-Resistance vs. Drain-Current

## Package Outline Dimensions

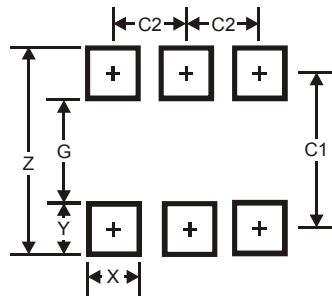
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT363			
Dim	Min	Max	Typ
A	0.10	0.30	0.25
B	1.15	1.35	1.30
C	2.00	2.20	2.10
D	0.65 Typ		
F	0.40	0.45	0.425
H	1.80	2.20	2.15
J	0	0.10	0.05
K	0.90	1.00	1.00
L	0.25	0.40	0.30
M	0.10	0.22	0.11
α	0°	8°	-
<b>All Dimensions in mm</b>			

## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
Z	2.5
G	1.3
X	0.42
Y	0.6
C1	1.9
C2	0.65

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