



BS870

N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

Features

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Lead, Halogen and Antimony Free, RoHS Compliant "Green" Device (Notes 2 and 4)

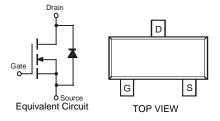
Mechanical Data

- Case: SOT-23
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminal Connections: See Diagram
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Marking Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.008 grams (approximate)



TOP VIEW

SOT-23



Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Units
Drain-Source Voltage		V_{DSS}	60	V
Drain-Gate Voltage $R_{GS} \le 1.0 M\Omega$		V_{DGR}	60	V
Gate-Source Voltage	Continuous	V_{GSS}	±20	V
Drain Current (Note 1)	Continuous	I_{D}	250	mA

Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 1)	P_d	300	mW
Thermal Resistance, Junction to Ambient	$R_{ hetaJA}$	417	°C/W
Operating and Storage Temperature Range	T _j , T _{STG}	-55 to +150	°C

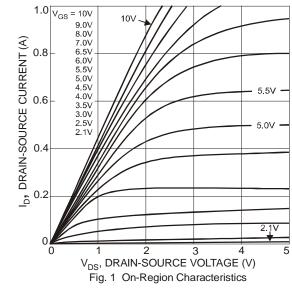
Electrical Characteristics @T_A = 25°C unless otherwise specified

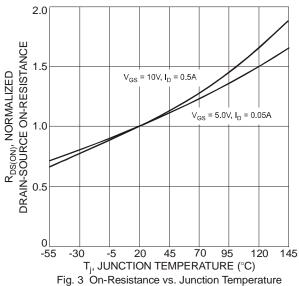
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 3)							
Drain-Source Breakdown Voltage	BV _{DSS}	60	80	_	V	$V_{GS} = 0V, I_D = 100 \mu A$	
Zero Gate Voltage Drain Current	I _{DSS}			0.5	μΑ	$V_{DS} = 25V, V_{GS} = 0V$	
Gate-Body Leakage	I _{GSS}	_	_	±10	nA	$V_{GS} = \pm 15V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 3)							
Gate Threshold Voltage	$V_{GS(th)}$	1.0	2.0	3.0	V	$V_{DS} = V_{GS}, I_D = 250 \mu A$	
Static Drain-Source On-Resistance	R _{DS (ON)}		3.5	5.0	Ω	$V_{GS} = 10V, I_D = 0.2A$	
On-State Drain Current	I _{D(ON)}	_	1.0	0.5	Α	$V_{GS} = 10V, V_{DS} = 7.5V$	
Forward Transconductance	g _{FS}	80			mS	$V_{DS} = 10V, I_D = 0.2A$	
DYNAMIC CHARACTERISTICS							
Input Capacitance	C _{iss}	_	22	50	pF	V 40V V 0V	
Output Capacitance	Coss		11	25	pF	$V_{DS} = 10V, V_{GS} = 0V$ f = 1.0MHz	
Reverse Transfer Capacitance	C _{rss}	_	2.0	5.0	pF		
SWITCHING CHARACTERISTICS			•				
Turn-On Delay Time	t _{D(ON)}		2.0	20	ns	$V_{ES} = 10V, R_L = 150\Omega,$	
Turn-Off Delay Time	t _{D(OFF)}		5.0	20	ns	$V_{DS} = 10V$, $R_D = 100\Omega$	

Notes:

- 1. Device mounted on FR-4 PCB 1.0 x 0.75 x 0.062 inch pad layout as shown on Diodes, Inc. suggested pad layout AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.
- 2. No purposefully added lead. Halogen and Antimony Free.
- 3. Short duration pulse test used to minimize self-heating effect.
- 4. Product manufactured with Data Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or Sb₂O₃ Fire Retardants.







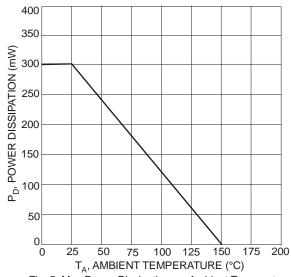


Fig. 5 Max Power Dissipation vs. Ambient Temperature

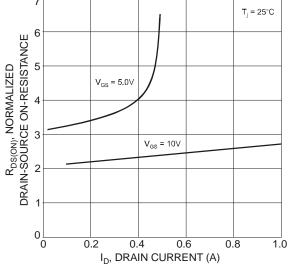


Fig. 2 On-Resistance vs. Drain Current

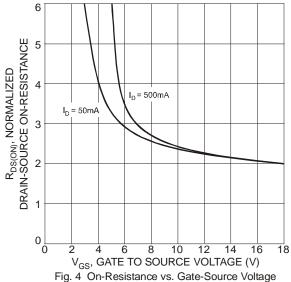


Fig. 4 On-Resistance vs. Gate-Source Voltage

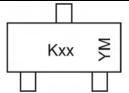


Ordering Information (Note 5)

Part Number	Case	Packaging
BS870-7-F	SOT-23	3000/Tape & Reel

Notes: 5. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information



Kxx = Product Type Marking Code, K70 or K6Z

YM = Date Code Marking

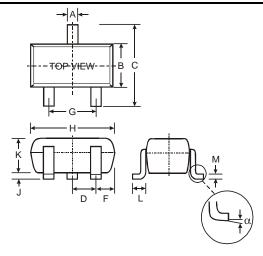
Y = Year ex: T = 2006

M = Month ex: 9 = September

Date Code Kev

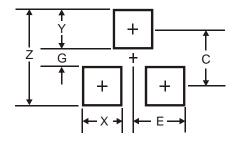
Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Code	J	K	L	М	N	Р	R	S	Т	U	V	W	Χ	Υ	Z
Month	Jan	Fe	b I	Mar	Apr	May	Ju	n	Jul	Aug	Sep	Oc	t	Nov	Dec
Code	1	2		3	4	5	6	;	7	8	9	0		N	D

Package Outline Dimensions



SOT-23				
Dim	Min	Max		
Α	0.37	0.51		
В	1.20	1.40		
C	2.30	2.50		
D	0.89	1.03		
F	0.45	0.60		
G	1.78	2.05		
H	2.80	3.00		
J	0.013	0.10		
K	0.903	1.10		
L	0.45 0.61			
М	0.085	0.180		
α	0°	8°		
All Dimensions in mm				

Suggested Pad Layout



Dimensions	Value (in mm)
Z	3.4
G	0.7
X	0.9
Υ	1.4
С	2.0
E	0.9

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