



BS870

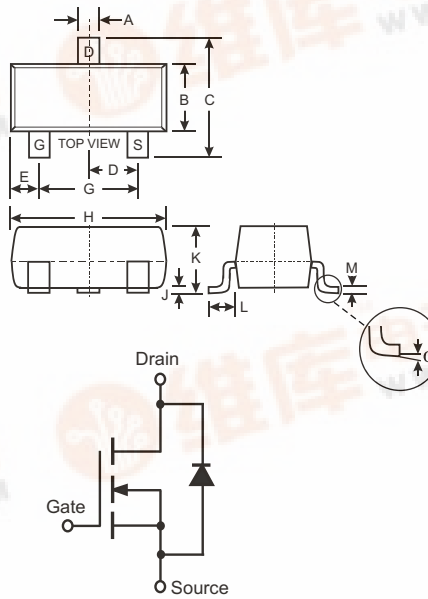
N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

Features

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Lead Free/RoHS Compliant (Note 2)

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 (See Page 2): K70
- Ordering & Date Code Information: See Page 2
- Weight: 0.008 grams (approximate)



SOT-23		
Dim	Min	Max
A	0.37	0.51
B	1.20	1.40
C	2.30	2.50
D	0.89	1.03
E	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
M	0.085	0.180
	0	8
All Dimensions in mm		

Maximum Ratings @ T_A = 25 C unless otherwise specified

Characteristic	Symbol	BS870	Units
Drain-Source Voltage	V _{DSS}	60	V
Drain-Gate Voltage R _{GS} 1.0M	V _{DGR}	60	V
Gate-Source Voltage Continuous	V _{GSS}	20	V
Drain Current (Note 1) Continuous	I _D	250	mA
Total Power Dissipation (Note 1)	P _d	300	mW
Thermal Resistance, Junction to Ambient	R _{JA}	417	K/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	C

- Note: 1. Device mounted on FR-5 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.



Electrical Characteristics @ T_A = 25 C unless otherwise specified

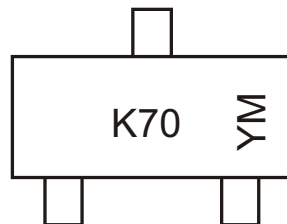
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 3)						
Drain-Source Breakdown Voltage	BV _{DSS}	60	80		V	V _{GS} = 0V, I _D = 100 A
Zero Gate Voltage Drain Current	I _{DSS}			0.5	μA	V _{DS} = 25V, V _{GS} = 0V
Gate-Body Leakage	I _{GSS}			10	nA	V _{GS} = 15V, V _{DS} = 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 A
Static Drain-Source On-Resistance	R _{DS(ON)}		3.5	5.0		V _{GS} = 10V, I _D = 0.2A
On-State Drain Current	I _{D(ON)}		1.0	0.5	A	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 _{DS} = 10V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oss}		11	25	pF	
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 Ω, V _{DS} = 10V, R _D = 100 Ω
Turn-Off Delay Time	t _{D(OFF)}		5.0	20	ns	

Ordering Information (Note 4)

Device	Packaging	Shipping
BS870-7-F	SOT-23	3000/Tape & Reel

- Notes: 3. Short duration test pulse used to minimize self-heating effect.
4. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



K70 = 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
Code	J	K	L	M	N	P	R	S	T	U	V	W
Month	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

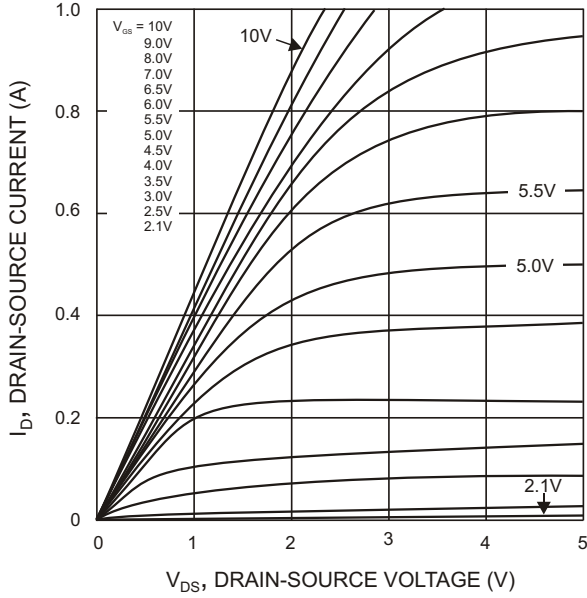


Fig. 1 On-Region Characteristics

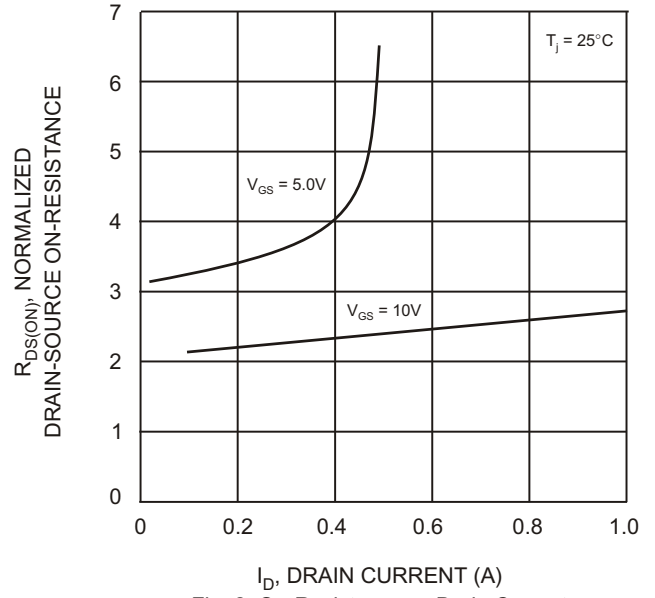


Fig. 2 On-Resistance vs Drain Current

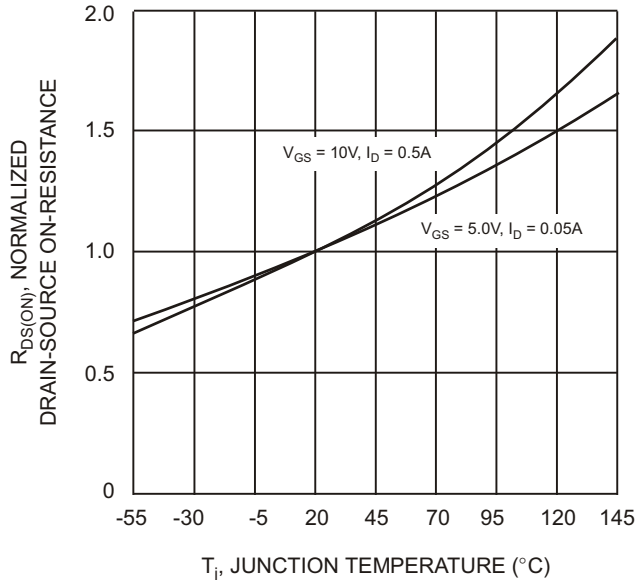


Fig. 3 On-Resistance vs Junction Temperature

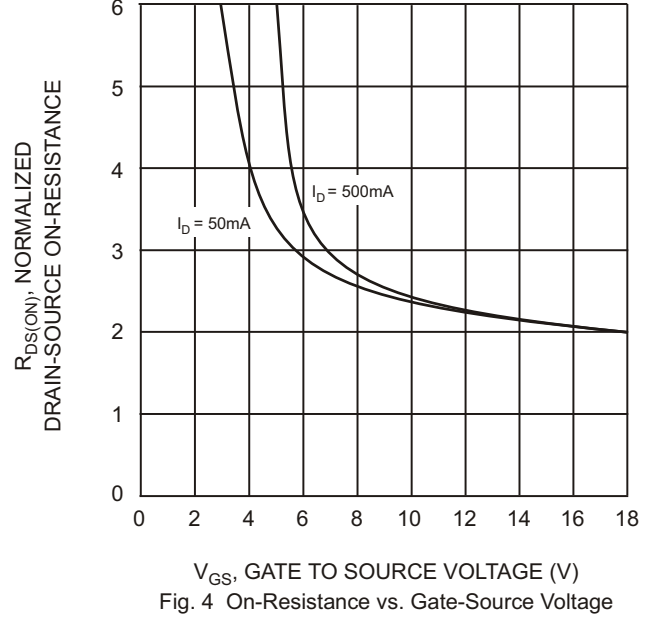


Fig. 4 On-Resistance vs. Gate-Source Voltage

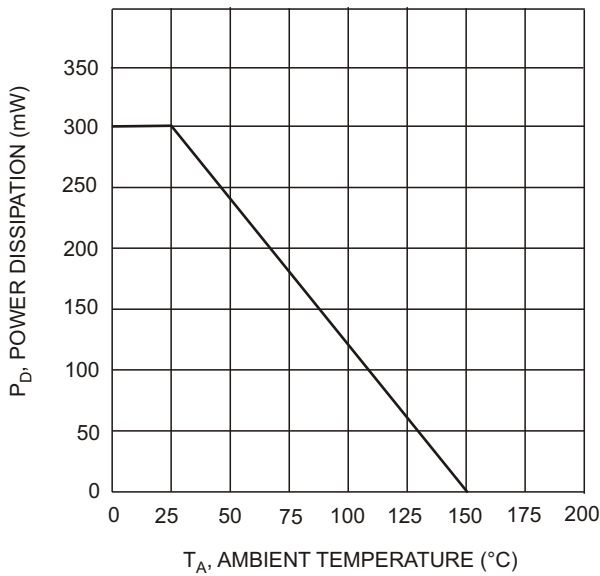


Fig. 5, Max Power Dissipation vs Ambient Temperature



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