





N-CHANNEL ENHANCEMENT MODE MOSFET

Features

- 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)
- Qualified to AEC-Q101 Standards for High Reliability
- PPAP Capable (Note 4)

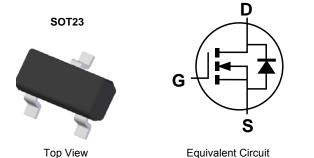
Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic.
 - 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 @3

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Top View

- Terminal Connections: See Diagram
- Weight: 0.008 grams (Approximate)



Ordering Information (Note 5)

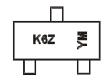
Part Number	Case	Packaging
MMBF170Q-7-F	SOT23	3,000/Tape & Reel
MMBF170Q-13-F	SOT23	10,000/Tape & Reel

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 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the
- Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_grade_definitions/.
- 5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information

SOT23



K6Z = Product Type Marking Code YM = Date Code Marking Y = Year (ex: A = 2014) M = Month (ex: 9 = September)

Date Code Key

Year	1998	1999	2000	2001	2002		2014	2015	2016	2015	2016	2017	2018	2019	2020
Code	J	K	L	M	N		В	С	D	С	D	Е	F	G	Н
Month	Jan	Fe	b	Mar	Apr	May	Ju	n	Jul	Aug	Sep	Oc	t	Nov	Dec
Code	1	2		3	4	5	6		7	8	9	0		Ν	D



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 Pulsed	V_{GSS}	±20 ±40	V
Drain Current (Note 6)	Continuous Pulsed	ID	500 800	mA

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

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 6)	P_{D}	300 1.80	mW mW/°C
Thermal Resistance, Junction to Ambient	$R_{ heta JA}$	417	K/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

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

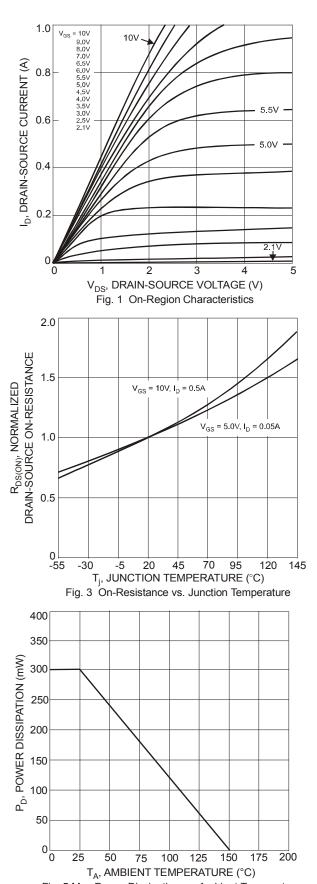
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 7)							
Drain-Source Breakdown Voltage	BV _{DSS}	60	70		V	$V_{GS} = 0V, I_D = 100\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}			1.0	μΑ	V _{DS} = 60V, V _{GS} = 0V	
Gate-Body Leakage	I _{GSS}		_	±10	nA	$V_{GS} = \pm 15V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 7)	_			-	_		
Gate Threshold Voltage	V _{GS(th)}	8.0	2.1	3.0	V	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	
Static Drain-Source On-Resistance	R _{DS (ON)}			5.0 5.3	Ω	$V_{GS} = 10V, I_D = 200mA$ $V_{GS} = 4.5V, I_D = 50mA$	
Forward Transconductance	9 FS	80	_	_	mS	$V_{DS} = 10V, I_D = 0.2A$	
DYNAMIC CHARACTERISTICS							
Input Capacitance	C _{iss}		22	40	pF		
Output Capacitance	Coss		11	30	pF	V _{DS} = 10V, V _{GS} = 0V, f = 1.0MHz	
Reverse Transfer Capacitance	Crss		2.0	5.0	pF		
SWITCHING CHARACTERISTICS							
Turn-On Time	t _{on}	_		10	ns	$V_{DD} = 25V, I_D = 0.5A,$	
Turn-Off Time	t _{off}	_	_	10	ns	V_{GS} = 10V, R_{GEN} = 50 Ω	

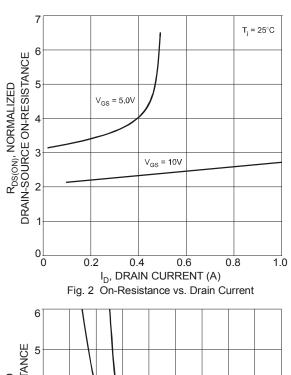
Notes:

^{6.} 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.

7. Short duration pulse test used to minimize self-heating effect.







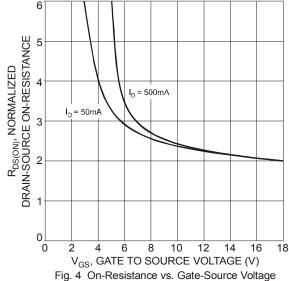
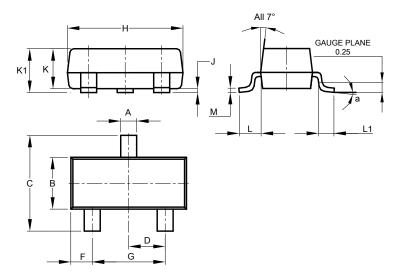


Fig. 5 Max Power Dissipation vs. Ambient Temperature



Package Outline Dimensions

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

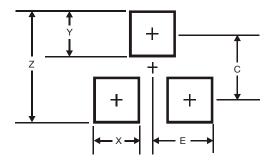


SOT23							
Dim	Min	Тур					
Α	0.37	0.51	0.40				
В	1.20	1.40	1.30				
C	2.30	2.50	2.40				
D	0.89	1.03	0.915				
F	0.45	0.60	0.535				
G	1.78	1.78 2.05					
H	2.80	3.00	2.90				
7	0.013	0.10	0.05				
K	0.890	1.00	0.975				
K1	0.903	1.10	1.025				
L	0.45	0.61	0.55				
L1	0.25	0.55	0.40				
M	0.085	0.150	0.110				
а	8°						
All Dimensions in mm							

Suggested Pad Layout

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

SOT23



Dimensions	Value (in mm)
Z	2.9
Х	0.8
Υ	0.9
С	2.0
F	1.35



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