





40V PNP MEDIUM POWER HIGH PERFORMANCE TRANSISTOR IN SOT23

Features

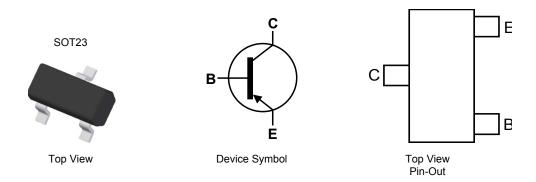
- BV_{CFO} > -40V
- I_C = -1A High Continuous Current
- I_{CM} = -2A Peak Pulse Current
- Low Saturation Voltage V_{CE(sat)} < -500mV @ -1A
- R_{SAT} = 350mΩ for a Low Equivalent On-resistance
- Complementary NPN type: FMMT491A
- Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)
- Halogen and Antimony 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, "Green" Molding Compound UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.008 grams (approximate)

Application

- Power MOSFET gate driving
- · Low loss power switching



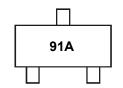
Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FMMT591ATA	AEC-Q101	91A	7	8	3,000
FMMT591ATC	AEC-Q101	91A	13	8	10,000
FMMT591AQTA	Automotive	91A	7	8	3,000

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 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 same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_compliance_definitions/.
- 5. For packaging details, go to our website at http://www.diodes.com/products/packages.html

Marking Information



91A = Product Type Marking Code





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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	-40	V
Collector-Emitter Voltage	V _{CEO}	-40	V
Emitter-Base Voltage	V _{EBO}	-7	V
Continuous Collector Current	Ic	-1	Α
Peak Pulse Current	Icm	-2	Α
Base Current	I _B	-200	mA
Peak Base Current	Івм	-1	Α

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

Characteristic	Symbol	Value	Unit	
Power Dissipation	(Note 6)	P_{D}	500	mW
Thermal Resistance, Junction to Ambient (No.		$R_{ heta JA}$	250	°C/W
Thermal Resistance, Junction to Lead (Note 7)		$R_{ heta JL}$	197	°C/W
Operating and Storage Temperature Range		$T_{J_i} T_{STG}$	-55 to +150	°C

ESD Ratings (Note 8)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	С

Notes:

^{6.} For a device mounted with the collector lead on 15mm x 15mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.

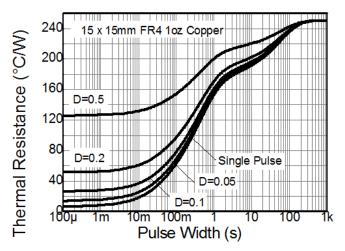
^{7.} Thermal resistance from junction to solder-point (at the end of the collector lead).

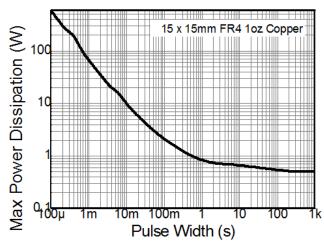
^{8.} Refer to JEDEC specification JESD22-A114 and JESD22-A115.





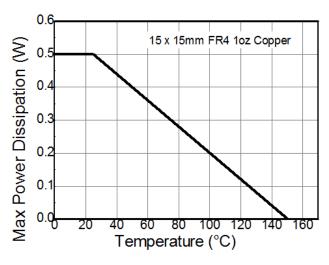
Thermal Characteristics and Derating Information





Transient Thermal Impedance

Pulse Power Dissipation



Derating Curve





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

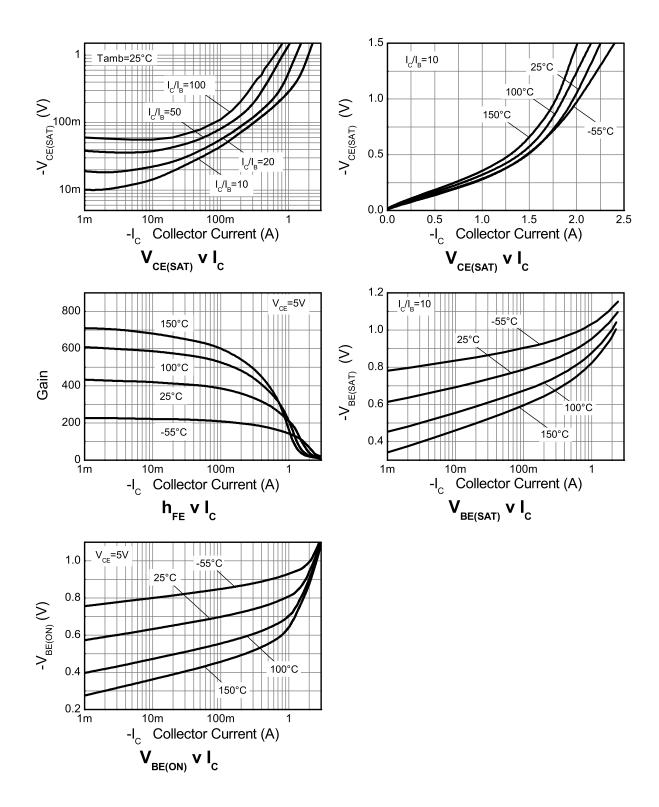
Characteristic		Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage		BV _{CBO}	-40	_	_	V	$I_{C} = -100 \mu A$
Collector-Emitter Breakdown Voltage (Note 9)		BV _{CEO}	-40	_	_	V	I _C = -10mA
Emitter-Base Breakdown	Voltage	BV _{EBO}	-7	_	_	V	I _E = -100μA
Collector Cutoff Current		I _{CBO}	_	_	-100	nA	V _{CB} = -30V
Collector-Emitter Cutoff C	urrent	I _{CES}	_	_	-100	nA	V _{CES} = -30V
Emitter Cutoff Current		I _{EBO}	_	_	-100	nA	V _{EB} = -5.6V
Collector-Emitter Saturation Voltage (Note 9)		V _{CE(sat)}		_	-200 -350 -500	mV	$I_C = -100 \text{mA}, I_B = -1 \text{mA}$ $I_C = -500 \text{mA}, I_B = -20 \text{mA}$ $I_C = -1 \text{A}, I_B = -100 \text{mA}$
Base-Emitter Saturation Voltage (Note 9)		V _{BE(sat)}	_	_	-1.1	V	$I_C = -1A$, $I_B = -100mA$
Base-Emitter Turn-On Voltage (Note 9)		V _{BE(on)}	_	_	-1.0	V	$I_{C} = -1A, V_{CE} = -5V$
Static Forward Current Transfer Ratio (Note 9)		h _{FE}	300 300 250 160 30	_	800 — — —	_	I _C = -1mA, V _{CE} = -5V I _C = -100mA, V _{CE} = -5V I _C = -500mA, V _{CE} = -5V I _C = -1A, V _{CE} = -5V I _C = -2A, V _{CE} = -5V
Transition Frequency		f _T	150	□00	_	MHz	V _{CE} = -10V, I _C = -50mA, f = 100MHz
Output Capacitance		C _{obo}		_	10	pF	V _{CB} = -10V, f = 1MHz
	Delay Time	t _(d)		34.9	_		
Switching Time	Rise Time	t _(r)		19.2	_	20	$V_{CC} = -10V, I_{C} = -500mA,$
Switching Time	Storage Time	t _(s)	_	249	_	ns	$I_{B1} = -I_{B2} = -25mA$
	Fall Time	t _(f)	_	62	_		

Note: 9. Measured under pulsed conditions. Pulse width $\leq 300 \mu s$. Duty cycle $\leq 2\%$





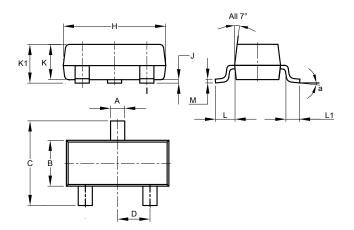
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)





Package Outline Dimensions

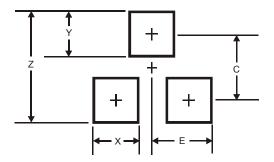
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



SOT23						
Dim	Min	Max	Тур			
Α	0.37	0.51	0.40			
В	1.20	1.40	1.30			
С	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			
Н	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			
М	0.085	0.150	0.110			
а	8°					
All	All Dimensions in mm					

Suggested Pad Layout

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



Dimensions	Value (in mm)		
Z	2.9		
X	0.8		
Υ	0.9		
С	2.0		
E	1.35		





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