



FMMT614

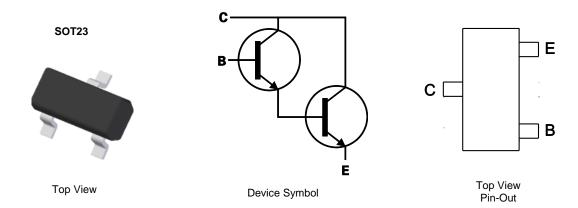
100V NPN DARLINGTON MEDIUM POWER TRANSISTOR IN SOT23

Features

- BV_{CEO} > 100V
- I_C = 0.5A High Continuous Collector Current
- I_{CM} = 2A Peak Pulse Current
- 500mW Power Dissipation
- Darlington Transistor with High h_{FE} up to 5k at I_C = 0.5A
- 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
- An Automotive-Compliant Part is Available Under Separate Datasheet (FMMT614Q)

Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic. "Green" Molding Compound.
 UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 🔞
- Weight: 0.008 grams (Approximate)



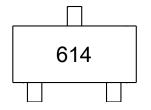
Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
FMMT614TA	AEC-Q101	614	7	8	3,000
FMMT614TC	AEC-Q101	614	13	8	10.000

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. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



614 = Product Type Marking Code



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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	120	V
Collector-Emitter Voltage	V _{CEO}	100	V
Emitter-Base Voltage	V _{EBO}	10	V
Continuous Collector Current	Ic	500	mA
Peak Pulse Current	I _{CM}	2	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P _D	500	mW
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	250	°C/W
Thermal Resistance, Junction to Lead (Note 6)	$R_{ heta JL}$	197	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 7)

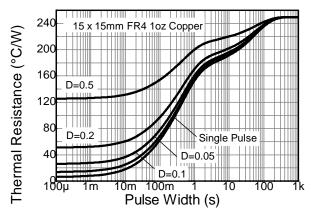
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	2,000	V	2
Electrostatic Discharge – Machine Model	ESD MM	200	V	В

Notes:

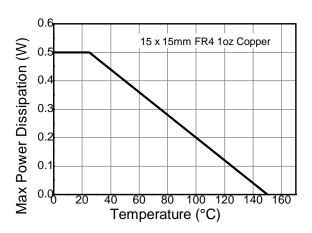
^{5.} For a device mounted on 15mm x 15mm 1oz weight copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
6. Thermal resistance from junction to solder-point (at the end of the collector lead).
7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.



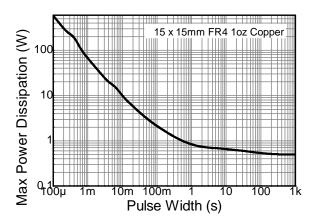
Thermal Characteristics and Derating Information



Transient Thermal Impedance



Derating Curve



Pulse Power Dissipation



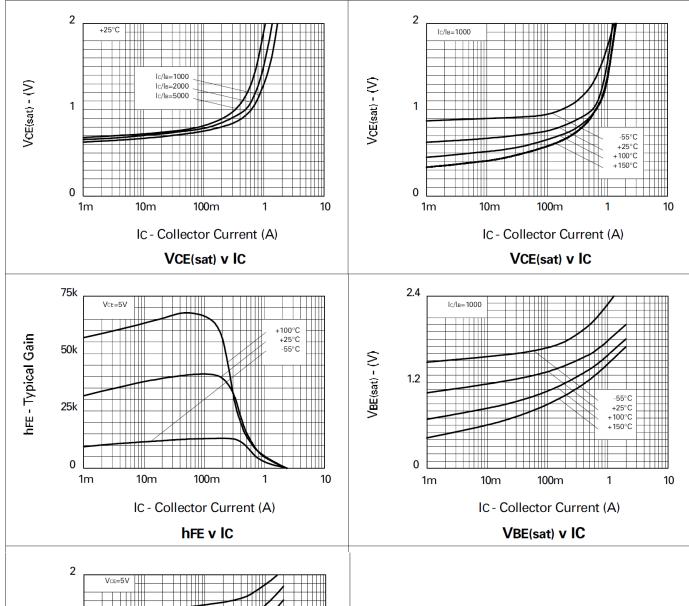
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	120	300	_	V	$I_C = 10\mu A$
Collector-Emitter Breakdown Voltage (Note 8)	BV _{CEO}	100	130	_	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	10	14	_	V	$I_E = 10\mu A$
Collector Cutoff Current	I _{CBO}	_	0.02	10	nA	V _{CB} = 100V
Emitter Cutoff Current	I _{EBO}	_	_	100	nA	V _{EB} = 8V
Collector Emitter Cutoff Current	I _{CES}	_	_	10	μΑ	V _{CE} = 100V
Static Forward Current Transfer Ratio (Note 8)	h _{FE}	15k 5k	_	_	_	I _C = 100mA, V _{CE} = 5V I _C = 500mA, V _{CE} = 5V
Collector-Emitter Saturation Voltage (Note 8)	V _{CE(SAT)}	_	0.9 0.78	1.0 0.9	V V	$I_C = 500 \text{mA}, I_B = 5 \text{mA}$ $I_C = 100 \text{mA}, I_B = 0.1 \text{mA}$
Base-Emitter Turn-On Voltage (Note 8)	V _{BE(ON)}	_	1.5	1.8	V	I _C = 500mA, V _{CE} = 5V
Base-Emitter Saturation Voltage (Note 8)	V _{BE(SAT)}	_	1.7	1.9	V	$I_C = 500 \text{mA}, I_B = 5 \text{mA}$
Output Capacitance	C _{OBO}	_	6	_	pF	V _{CB} = 10V, f = 100mHz
Switching Times	t _{ON}	_	0.7	_	μs	$I_C = 100\mu A, I_B = 0.1 mA,$
Switching filles	t _{OFF}	_	2.5	_	μs	V _S = 10V

Note: 8. Measured under pulsed conditions. Pulse width \leq 300µs. Duty cycle \leq 2%.



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

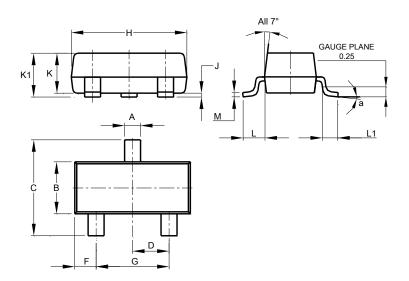




Package Outline Dimensions

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

SOT23

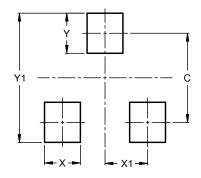


SOT23					
Dim	Min	Max	Тур		
Α	0.37	0.51	0.40		
В	1.20	1.40	1.30		
С	2.30	2.50	2.40		
D	0.89	1.03	0.915		
F	0.45	0.60	0.535		
G	1.78	2.05	1.83		
Н	2.80	3.00	2.90		
J	0.013	0.10	0.05		
K	0.890	1.00	0.975		
K1	0.903	1.10	1.025		
L	0.45	0.61	0.55		
L1	0.25	0.55	0.40		
M	0.085	0.150	0.110		
а	0°	8°	_		
All Dimensions in mm					

Suggested Pad Layout

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

SOT23



Dimensions	Value (in mm)		
С	2.0		
Х	0.8		
X1	1.35		
Y	0.9		
Y1	2.9		

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.



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