

## Features

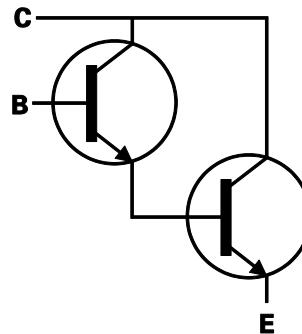
- $BV_{CEO} > 100V$
- $I_C = 0.5A$  High Continuous Collector Current
- $I_{CM} = 2A$  Peak Pulse Current
- 500mW Power Dissipation
- Darlington Transistor with High  $h_{FE}$  up to 5k at  $I_C = 0.5A$
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- Qualified to AEC-Q101 Standards for High Reliability
- An Automotive-Compliant Part is Available Under Separate Datasheet ([FMMT614Q](#))

## Mechanical Data

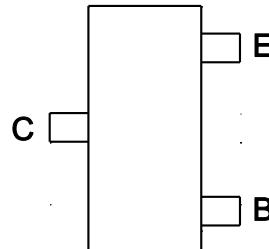
- Case: SOT23
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.008 grams (Approximate)



Top View



Device Symbol


 Top View  
 Pin-Out

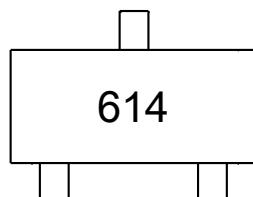
## Ordering Information (Note 4)

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.
2. See [http://www.diodes.com/quality/lead\\_free.html](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** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{\text{CBO}}$	120	V
Collector-Emitter Voltage	$V_{\text{CEO}}$	100	V
Emitter-Base Voltage	$V_{\text{EBO}}$	10	V
Continuous Collector Current	$I_C$	500	mA
Peak Pulse Current	$I_{\text{CM}}$	2	A

**Thermal Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	$P_D$	500	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	250	°C/W
Thermal Resistance, Junction to Lead (Note 6)	$R_{\theta JL}$	197	°C/W
Operating and Storage Temperature Range	$T_J, T_{\text{STG}}$	-55 to +150	°C

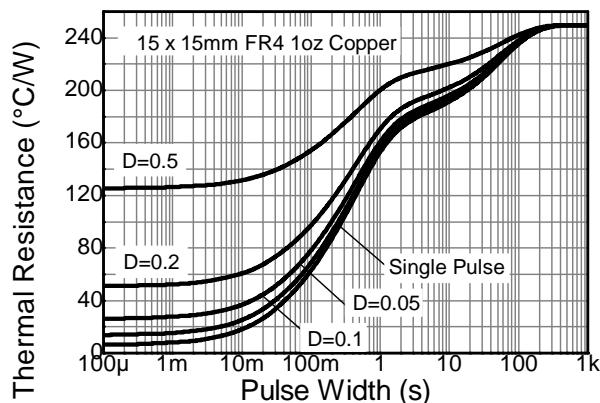
**ESD Ratings** (Note 7)

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	B

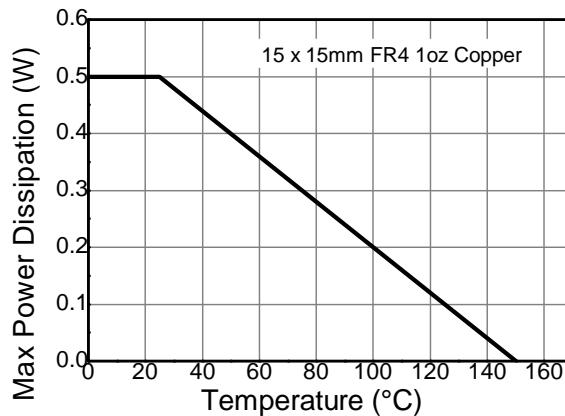
Notes:

- 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.

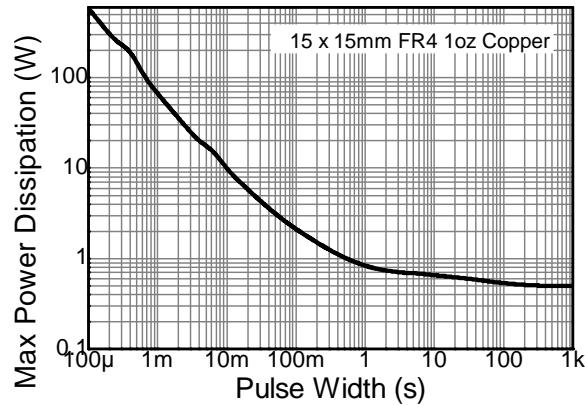
## Thermal Characteristics and Derating Information



**Transient Thermal Impedance**



**Derating Curve**



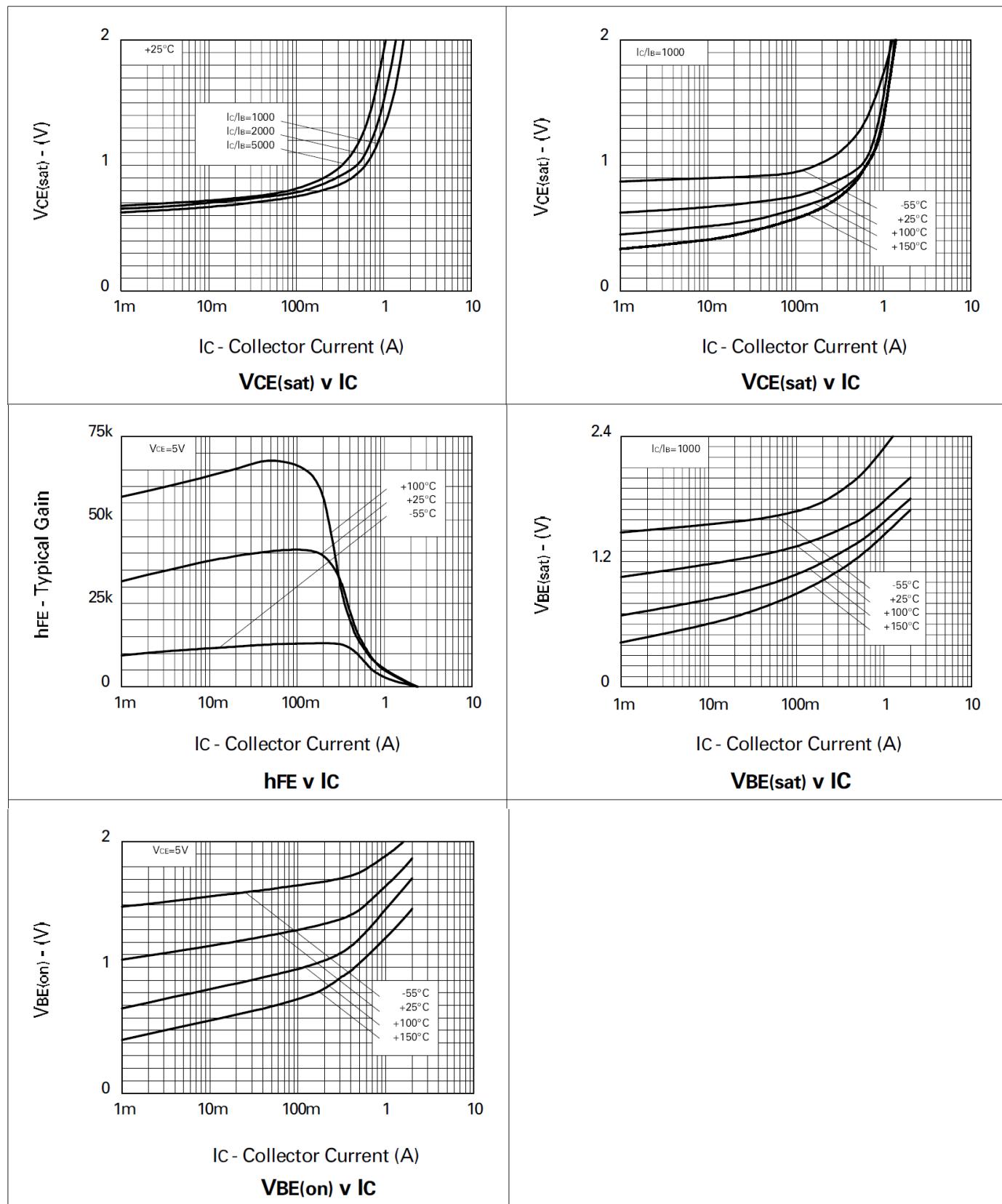
**Pulse Power Dissipation**

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$\text{BV}_{\text{CBO}}$	120	300	—	V	$I_C = 10\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 8)	$\text{BV}_{\text{CEO}}$	100	130	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	$\text{BV}_{\text{EBO}}$	10	14	—	V	$I_E = 10\mu\text{A}$
Collector Cutoff Current	$I_{\text{CBO}}$	—	0.02	10	nA	$V_{\text{CB}} = 100\text{V}$
Emitter Cutoff Current	$I_{\text{EBO}}$	—	—	100	nA	$V_{\text{EB}} = 8\text{V}$
Collector Emitter Cutoff Current	$I_{\text{CES}}$	—	—	10	$\mu\text{A}$	$V_{\text{CE}} = 100\text{V}$
Static Forward Current Transfer Ratio (Note 8)	$\text{h}_{\text{FE}}$	15k 5k	— —	— —	—	$I_C = 100\text{mA}, V_{\text{CE}} = 5\text{V}$ $I_C = 500\text{mA}, V_{\text{CE}} = 5\text{V}$
Collector-Emitter Saturation Voltage (Note 8)	$V_{\text{CE}(\text{SAT})}$	—	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)	$V_{\text{BE}(\text{ON})}$	—	1.5	1.8	V	$I_C = 500\text{mA}, V_{\text{CE}} = 5\text{V}$
Base-Emitter Saturation Voltage (Note 8)	$V_{\text{BE}(\text{SAT})}$	—	1.7	1.9	V	$I_C = 500\text{mA}, I_B = 5\text{mA}$
Output Capacitance	$C_{\text{COBO}}$	—	6	—	pF	$V_{\text{CB}} = 10\text{V}, f = 100\text{mHz}$
Switching Times	$t_{\text{ON}}$	—	0.7	—	$\mu\text{s}$	$I_C = 100\mu\text{A}, I_B = 0.1\text{mA},$
	$t_{\text{OFF}}$	—	2.5	—	$\mu\text{s}$	$V_s = 10\text{V}$

Note: 8. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

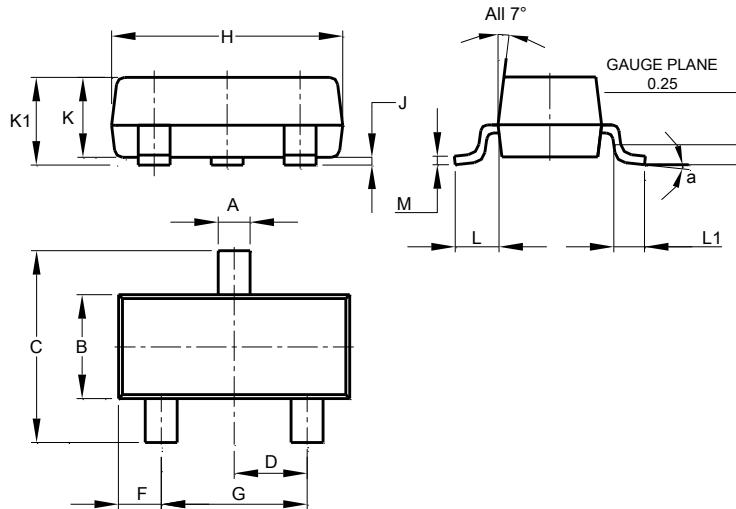
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



## Package Outline Dimensions

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

**SOT23**



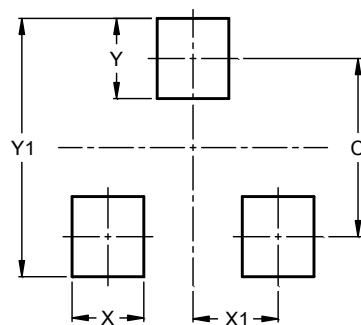
<b>SOT23</b>			
<b>Dim</b>	<b>Min</b>	<b>Max</b>	<b>Typ</b>
<b>A</b>	0.37	0.51	0.40
<b>B</b>	1.20	1.40	1.30
<b>C</b>	2.30	2.50	2.40
<b>D</b>	0.89	1.03	0.915
<b>F</b>	0.45	0.60	0.535
<b>G</b>	1.78	2.05	1.83
<b>H</b>	2.80	3.00	2.90
<b>J</b>	0.013	0.10	0.05
<b>K</b>	0.890	1.00	0.975
<b>K1</b>	0.903	1.10	1.025
<b>L</b>	0.45	0.61	0.55
<b>L1</b>	0.25	0.55	0.40
<b>M</b>	0.085	0.150	0.110
<b>a</b>	0°	8°	—

All Dimensions in mm

## Suggested Pad Layout

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

**SOT23**



<b>Dimensions</b>	<b>Value (in mm)</b>
<b>C</b>	2.0
<b>X</b>	0.8
<b>X1</b>	1.35
<b>Y</b>	0.9
<b>Y1</b>	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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