

FMMT634Q

100V NPN DARLINGTON TRANSISTOR IN SOT23

Description

This Bipolar Junction Transistor (BJT) has been designed to meet the stringent requirements of Automotive Applications.

Features

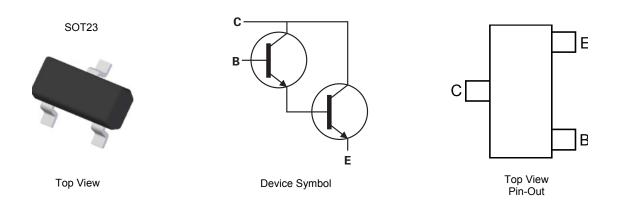
- $BV_{CEO} > 100V$
- I_C = 900mA high Continuous Collector Current
- I_{CM} = 5A Peak Pulse Current
- 625mW Power dissipation
- hFE > 5k up to 2A for high current gain hold up
- Complementary PNP Type: FMMT734Q
- Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" 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)

Applications

- Automotive
- Lamp
- Relay
- Solenoid Driving



Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FMMT634QTA	Automotive	634	7	8	3,000

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. Notes

- 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 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



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FMMT634Q

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}	12	V
Continuous Collector Current	Ic	900	mA
Peak Pulse Current	I _{CM}	5	Α

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P _D	625	mW
Power Dissipation (Note 7)	P _D	806	mW
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	200	°C/W
Thermal Resistance, Junction to Ambient (Note 7)	R _{θJA}	155	°C/W
Thermal Resistance, Junction to Leads (Note 8)	R _{θJL}	194	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 9)

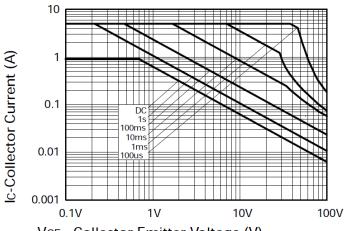
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	2,000	V	2
Electrostatic Discharge - Machine Model	ESD MM	200	V	В

Notes:

- 6. For a device mounted with the exposed collector pad on 25mm x 25mm 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. Same as note (6), except the device is measured at $t \le 5$ sec.
- 8. Thermal resistance from junction to solder-point (at the end of the collector lead).
- 9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

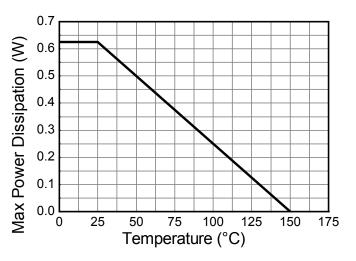


Thermal Characteristics and Derating information

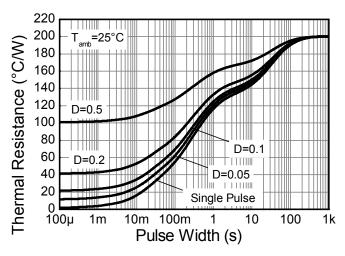


VCE - Collector Emitter Voltage (V)

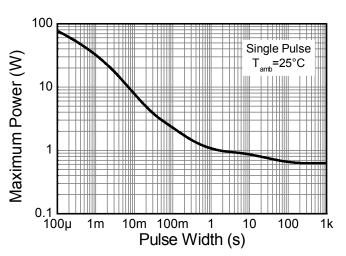
Safe Operating Area



Derating Curve

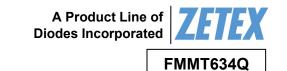


Transient Thermal Impedance



Pulse Power Dissipation



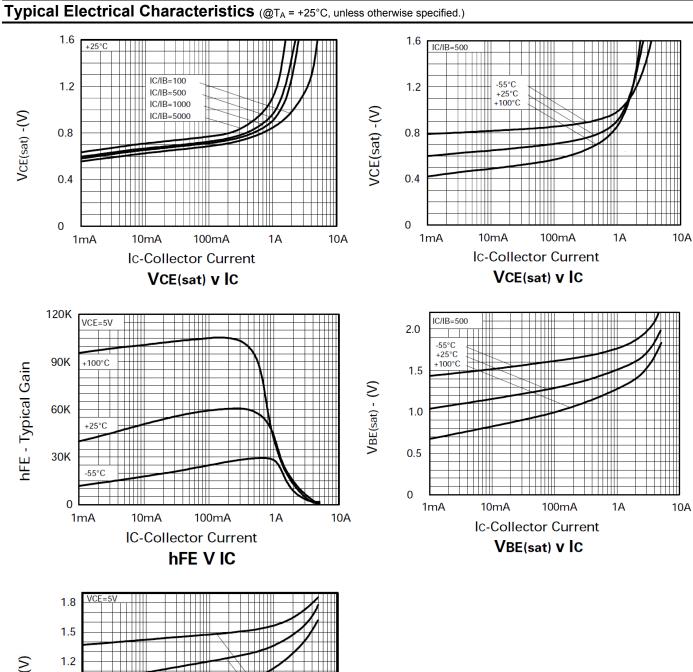


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	120	170	-	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Note 10)	BV _{CEO}	100	115	-	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	12	16	-	V	I _E = 100μA
Collector Cut-off Current	I _{CBO}	-	<1	10	nA	V _{CB} = 80V
Emitter Cut-off Current	I _{EBO}	-	<1	10	nA	V _{EB} = 7V
Collector Emitter Cut-off Current	I _{CES}	-	<1	100	nA	V _{CES} = 80V
Static Forward Current Transfer Ratio (Note 10) Collector-Emitter Saturation Voltage (Note 10)	h _{FE}	- 20k 15k 5k - - -	50k 60k 40k 14k 24k 600 0.67 0.72	- - - - - - - 0.75 0.80 0.85	- V	I _C = 10mA, V _{CE} = 5V I _C = 100mA, V _{CE} = 5V I _C = 1A, V _{CE} = 5V I _C = 2A, V _{CE} = 5V I _C = 1A, V _{CE} = 2V I _C = 5A, V _{CE} = 5V I _C = 100mA, I _B = 1mA I _C = 250mA, I _B = 5mA
	OL(Gut)	- - -	0.82 0.68 0.85	0.93 - 0.96		I _C = 900mA, I _B = 5mA I _C = 900mA, I _B = 5mA, T _J = +150°C I _C = 1A, I _B = 5mA
Base-Emitter Saturation Voltage (Note 10)	V _{BE(sat)}	-	1.5	1.65	V	$I_C = 1A$, $I_B = 5mA$
Base-Emitter Turn-On Voltage (Note 10)	V _{BE(on)}	-	1.33	1.50	V	I _C = 1A, V _{CE} = 5V
Transition Frequency	f _T	-	140	-	MHz	$I_C = 50$ mA, $V_{CE} = 10$ V, $f = 100$ MHz
Output Capacitance	C_{obo}	-	9	20	рF	V _{CB} = 10V, f = 1MHz
Turn-On Time	t _(on)	-	290	-	ns	V _{CC} = 20V, I _C = 500mA,
Turn-Off Time	$t_{(off)}$	-	2,400	-	ns	$I_{B1} = -I_{B2} = 1 \text{mA}$

Note: 10. Measured under pulsed conditions. Pulse width \leq 300 μ s. Duty cycle \leq 2%

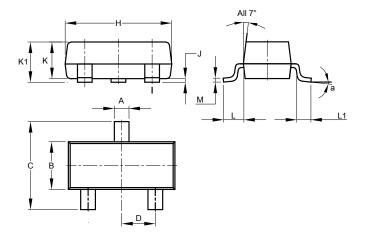






Package Outline Dimensions

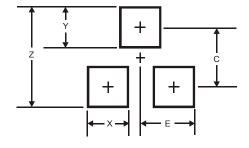
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



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		
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		
М	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.

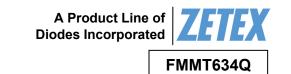


Dimensions	Value (in mm)		
Z	2.9		
X	0.8		
Y	0.9		
С	2.0		
E	1.35		

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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