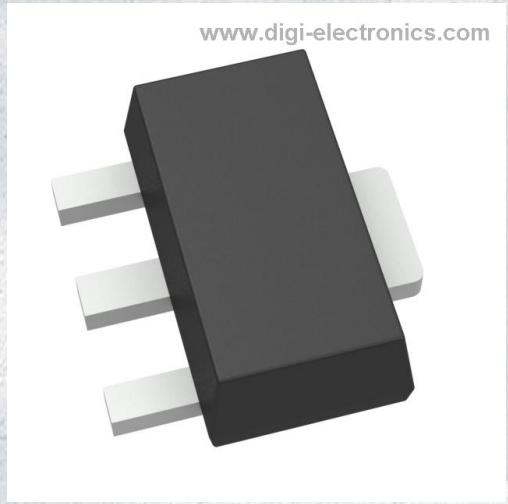
FCX591AQTA Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	FCX591AQTA-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	FCX591AQTA
Description	TRANS PNP 40V 1A SOT89-3
Detailed Description	Bipolar (BJT) Transistor PNP 40 V 1 A 150MHz 1 W Surface Mount SOT-89-3

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
FCX591AQTA	Diodes Incorporated
Series:	Product Status:
-	Active
Transistor Type:	Current - Collector (Ic) (Max):
PNP	1 A
Voltage - Collector Emitter Breakdown (Max):	Vce Saturation (Max) @ Ib, Ic:
40 V	500mV @ 100mA, 1A
Current - Collector Cutoff (Max):	DC Current Gain (hFE) (Min) @ Ic, Vce:
100nA	300 @ 100mA, 5V
Power - Max:	Frequency - Transition:
1 W	150MHz
Operating Temperature:	Grade:
-65°C ~ 150°C (TJ)	Automotive
Qualification:	Mounting Type:
AEC-Q101	Surface Mount
Package / Case:	Supplier Device Package:
TO-243AA	SOT-89-3
Base Product Number:	
FCX591	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.29.0075	

Lead-free Green

FCX591AQ

40V PNP MEDIUM POWER TRANSISTOR IN SOT89

Description

This Bipolar Junction Transistor (BJT) is designed to meet the stringent requirements of automotive applications.

Features

- BV_{CEO} > -40V
- Maximum Continuous Current I_C = -1A
- Low Saturation Voltage $V_{CE(sat)}$ < -500mV @ -1A
- Complementary NPN type: FCX491AQ
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The FCX591AQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**
  https://www.diodes.com/quality/product-definitions/

Mechanical Data

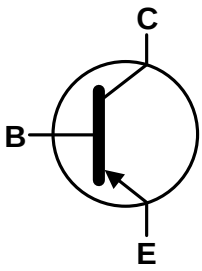
- Package: SOT89
- Package Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.05 grams (Approximate)

Application

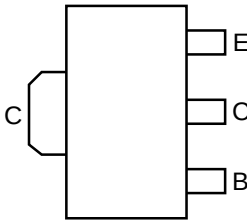
- Power MOSFET & IGBT gate driving
- Low loss power switching

SOT89

Top View



Device Symbol



Top View
Pin Out

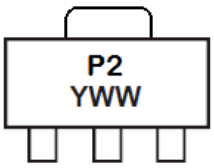
Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
FCX591AQTA	SOT89	P2	7	12	1,000	Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ 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 https://www.diodes.com/design/support/packaging/diodes-packaging/

Marking Information

SOT89



P2 = Product Type Marking Code
YWW = Date Code Marking
Y = Last Digit of Year (ex: 3 = 2023)
WW = Week Code (01 to 53)

Absolute Maximum Ratings (@T_A = +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	I_C	-1	A
Peak Pulse Current	I_{CM}	-2	A
Peak Base Current	I_B	-200	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	1	W
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	125	°C/W
Thermal Resistance, Junction to Leads (Note 6)	$R_{\theta JL}$	10.01	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	°C

ESD Ratings (Note 7)

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	C

Notes:
5. For a device surface mounted on 15mm X 15mm FR-4 PCB with high coverage of single sided 1 oz copper, in still air conditions; device measured when operating in steady state condition.
6. Thermal resistance from junction to solder-point (on the exposed collector pad).
7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

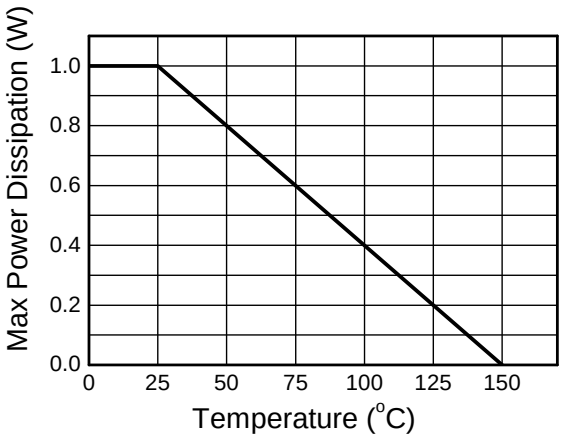


Fig. 1 Derating Curve

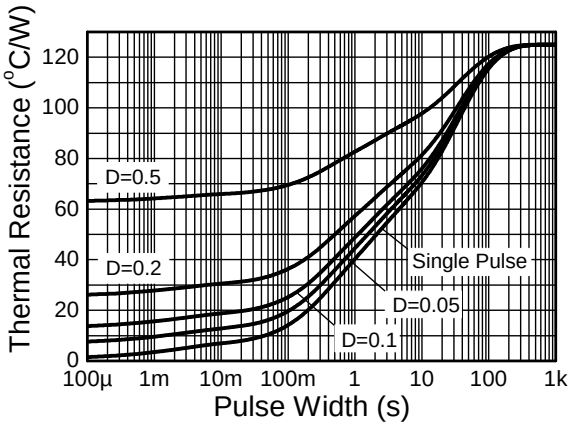


Fig. 2 Transient Thermal Impedance

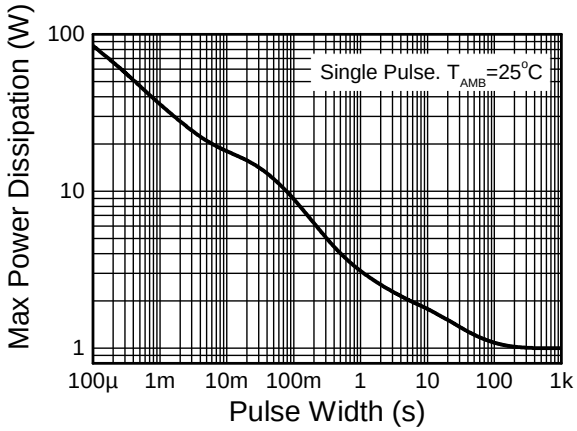


Fig. 3 Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-40	—	—	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Note 8)	BV_{CEO}	-40	—	—	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	—	—	V	I_E = -100µA
Collector Base Cutoff Current	I_{CBO}	—	—	-100	nA	V_{CB} = -30V
Emitter Base Cutoff Current	I_{EBO}	—	—	-100	nA	V_{EB} = -4V
Collector Cutoff Current	I_{CES}	—	—	-100	nA	V_{CES} = -30V
DC Current Transfer Static Ratio (Note 8)	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
Collector-Emitter Saturation Voltage (Note 8)	$V_{CE(sat)}$	— — —	— — —	-0.2 -0.35 -0.5	V	I_C = -100mA, I_B = -1mA I_C = -500mA, I_B = -20mA I_C = -1A, I_B = -100mA
Base-Emitter Saturation Voltage (Note 8)	$V_{BE(sat)}$	—	—	-1.1	V	I_C = -1A, I_B = -50mA
Base-Emitter Turn-on Voltage (Note 8)	$V_{BE(on)}$	—	—	-1.0	V	I_C = -1A, V_{CE} = -5V
Transitional Frequency	f_T	150	—	—	MHz	I_E = -50mA, V_{CE} = -10V f = 100MHz
Output Capacitance	C_{obo}	—	—	10	pF	V_{CB} = -10V, f = 1MHz

Notes: 8. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

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

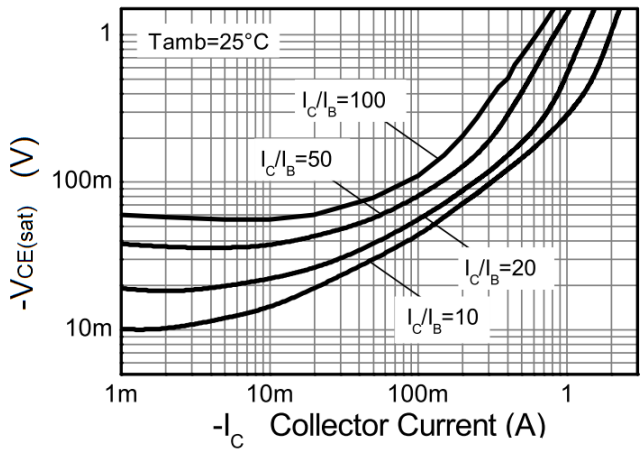


Fig. 4 $V_{CE(sat)}$ v I_C

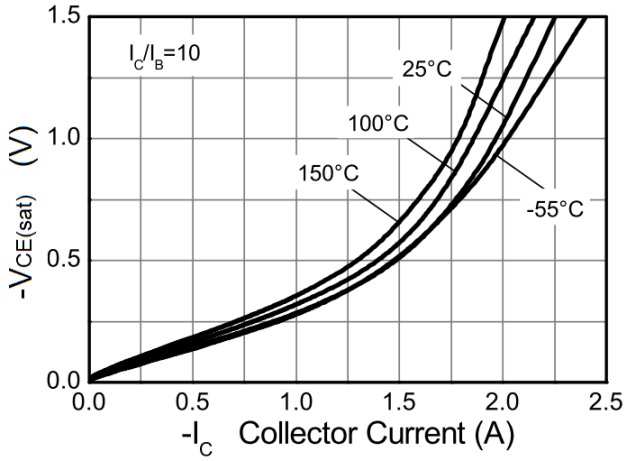


Fig. 5 $V_{CE(sat)}$ v I_C

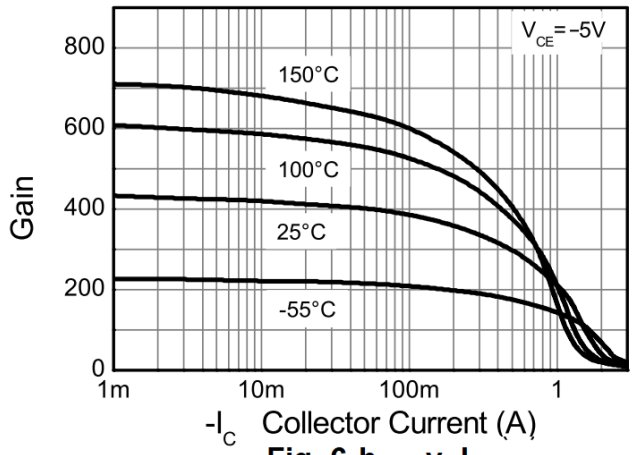


Fig. 6 h_{FE} v I_C

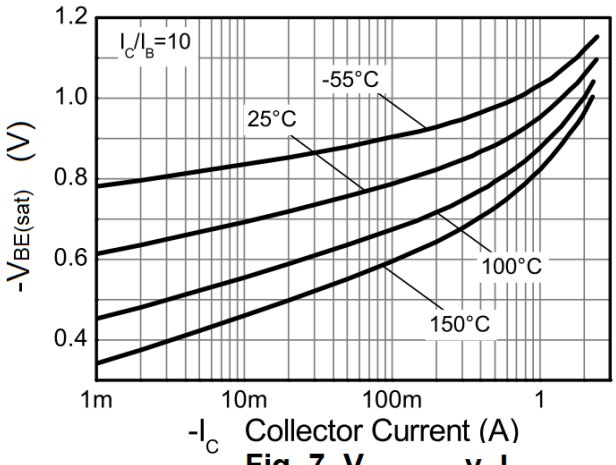


Fig. 7 $V_{BE(sat)}$ v I_C

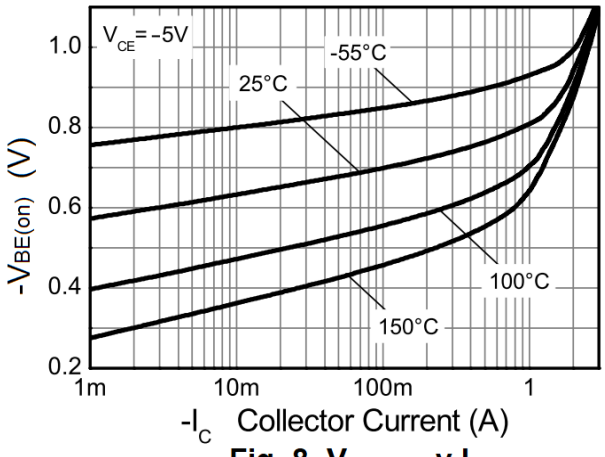
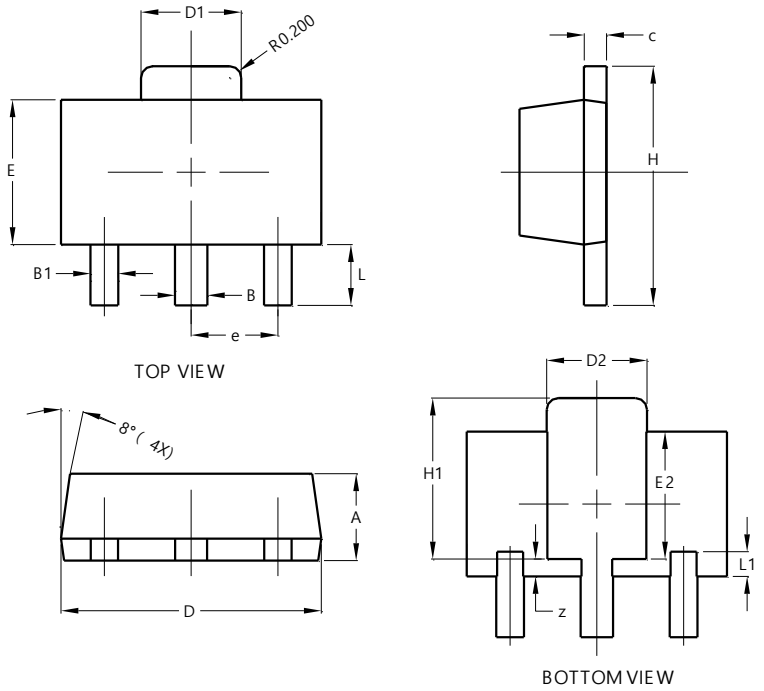


Fig. 8 $V_{BE(on)}$ v I_C

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT89

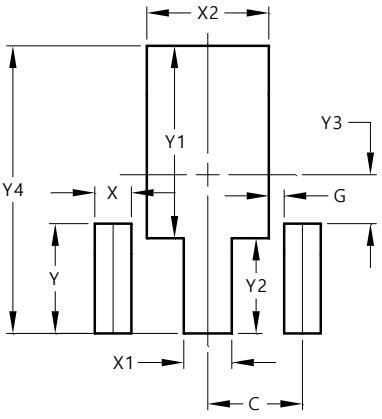


SOT89			
Dim	**Min**	**Max**	**Typ**
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT89



Dimensions	Value (in mm)
C	1.500
G	0.244
X	0.580
X1	0.760
X2	1.933
Y	1.730
Y1	3.030
Y2	1.500
Y3	0.770
Y4	4.530

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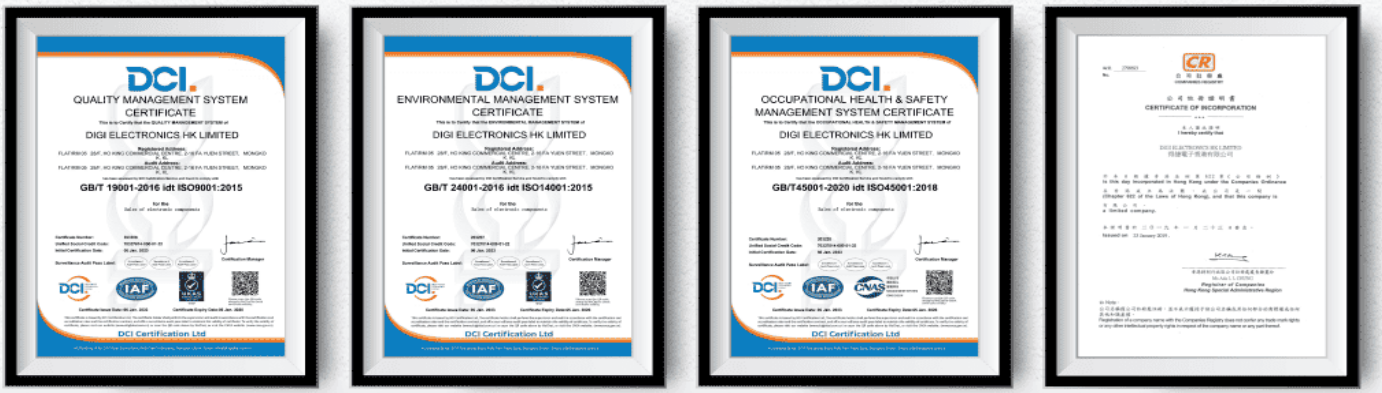

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