

BC817-40-7-F Datasheet



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	BC817-40-7-F-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	BC817-40-7-F
Description	TRANS NPN 45V 0.5A SOT23-3
Detailed Description	Bipolar (BJT) Transistor NPN 45 V 500 mA 100MHz 3 10 mW Surface Mount SOT-23-3



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DiGi is a global authorized distributor of electronic components.

Purchase and inquiry

Manufacturer Product Number:

BC817-40-7-F

Series:

-

Transistor Type:

NPN

Voltage - Collector Emitter Breakdown (Max):

45 V

Current - Collector Cutoff (Max):

100nA

Power - Max:

310 mW

Operating Temperature:

-65°C ~ 150°C (TJ)

Qualification:

AEC-Q101

Package / Case:

TO-236-3, SC-59, SOT-23-3

Base Product Number:

BC817

Manufacturer:

Diodes Incorporated

Product Status:

Active

Current - Collector (Ic) (Max):

500 mA

Vce Saturation (Max) @ Ib, Ic:

700mV @ 50mA, 500mA

DC Current Gain (hFE) (Min) @ Ic, Vce:

250 @ 100mA, 1V

Frequency - Transition:

100MHz

Grade:

Automotive

Mounting Type:

Surface Mount

Supplier Device Package:

SOT-23-3

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.21.0075

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

Features

- Ideally Suited for Automatic Insertion
- Epitaxial Planar Die Construction
- Complementary PNP Types Available (BC807)
- For switching and AF Amplifier Applications
- **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**
- **Automotive-Compliant Parts Are Available Under Separate Datasheet (BC817-16Q_40Q)**

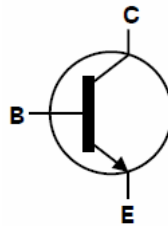
Mechanical Data

- 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)

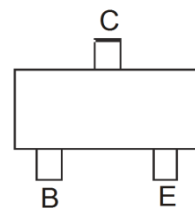
SOT23



Top View



Device Symbol

Top View
Pin-Out

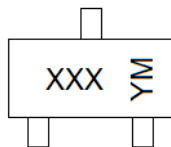
Ordering Information (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
BC817-16-7-F	AEC-Q101	K6A	7	8	3,000
BC817-25-7-F	AEC-Q101	K6B	7	8	3,000
BC817-40-7-F	AEC-Q101	K6C	7	8	3,000

- 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 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

SOT23



XXX = Product Type Marking Code (See Table Above)
 YM = Date Code Marking
 Y = Year (ex: C = 2015)
 M = Month (ex: 9 = September)

Date Code Key

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Code	C	D	E	F	G	H	I	J	K	L	M	N

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D



BC817-16/-25/-40

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CB0}	50	V
Collector-Emitter Voltage	V _{CEO}	45	V
Emitter-Base Voltage	V _{EBO}	5.0	V
Collector Current	I _C	0.5	A
Peak Collector Current	I _{CM}	1.0	A
Peak Base Current	I _{BM}	200	mA

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

Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	(Note 5)	310
		(Note 6)	350
Thermal Resistance, Junction to Ambient	R _{θJA}	(Note 5)	403
		(Note 6)	357
Thermal Resistance, Junction to Leads	R _{θJL}	350	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150	°C

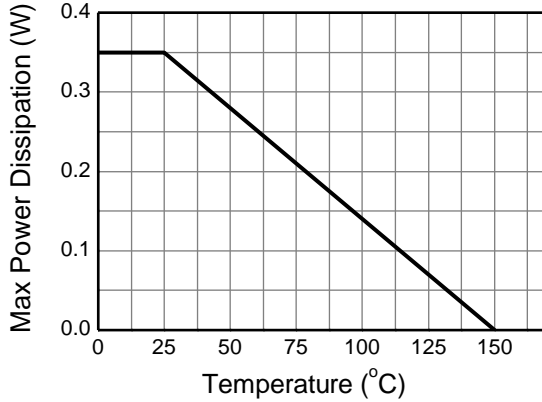
ESD Ratings (Note 8)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	8,000	V	3B
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

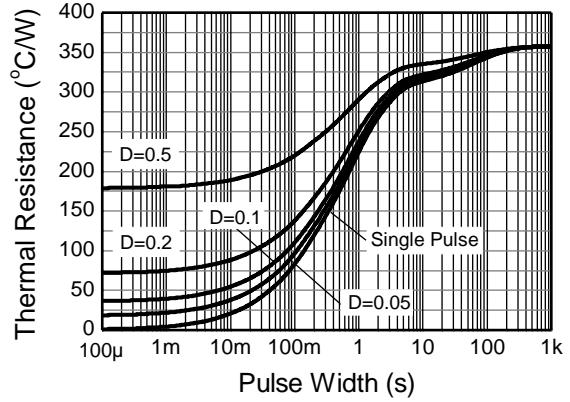
- Notes:
5. For a device mounted on minimum recommended pad layout FR-4 PCB with high coverage of single sided 1oz copper; device is measured under still air conditions whilst operating in a steady-state.
 6. Same as Note 5, except mounted on 15mm x 15mm 1oz copper.
 7. Thermal resistance from junction to solder-point (at the end of the collector lead).
 8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.



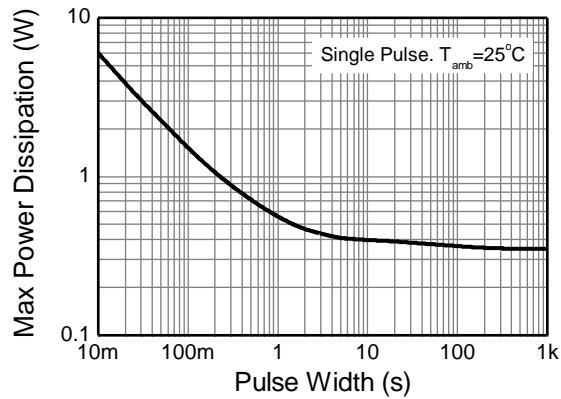
Thermal Characteristics and Derating Information



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation



BC817-16/-25/-40

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
Collector-Base Breakdown Voltage	BV _{CBO}	50	—	—	V	I _C = 100μA	
Collector-Emitter Breakdown Voltage	BV _{CEO}	45	—	—	V	I _C = 10mA	
Emitter-Base Breakdown Voltage	BV _{EBO}	5	—	—	V	I _C = 100μA	
Collector-Emitter Cut-Off Current	I _{CES}	—	—	100 5.0	nA μA	V _{CE} = 45V V _{CE} = 25V, T _J = +150°C	
Emitter-Base Cut-Off Current	I _{EBO}	—	—	100	nA	V _{EB} = 5.0V	
DC Current Gain (Note 9)	h _{FE}	BC817-16	100	—	250	—	V _{CE} = 1.0V, I _C = 100mA
		BC817-25	160		400		
		BC817-40	250		600		
		BC817-16	60				V _{CE} = 1.0V, I _C = 300mA
		BC817-25	100		—		
		BC817-40	170				
Collector-Emitter Saturation Voltage (Note 9)	V _{CE(SAT)}	—	—	0.7	V	I _C = 500mA, I _B = 50mA	
Base-Emitter Voltage (Note 9)	V _{BE}	—	—	1.2	V	V _{CE} = 1.0V, I _C = 300mA	
Gain Bandwidth Product	f _T	100	—	—	MHz	V _{CE} = 5.0V, I _C = 10mA, f = 50MHz	
Collector-Base Capacitance	C _{CBO}	—	—	12	pF	V _{CB} = 10V, f = 1.0MHz	

Note: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.



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

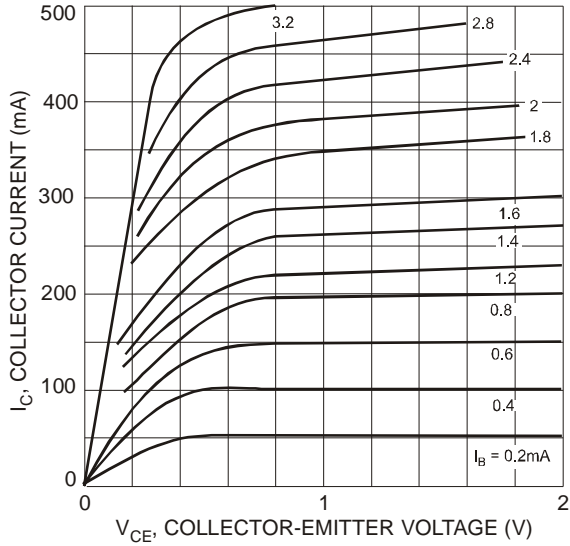


Figure 1 Typical Collector Current vs. Collector-Emitter Voltage

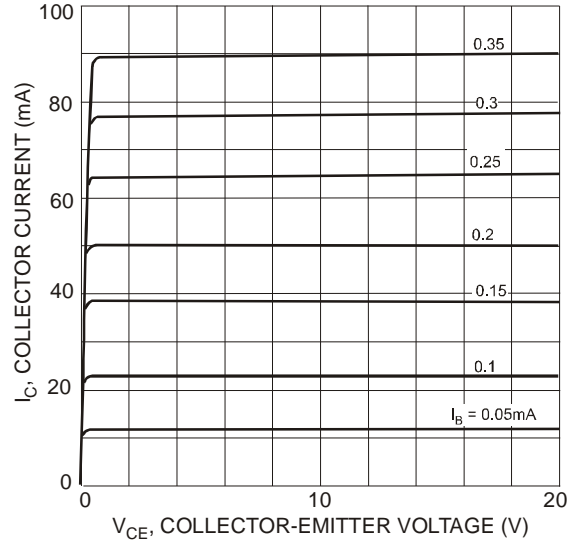


Figure 2 Typical Collector Current vs. Collector-Emitter Voltage

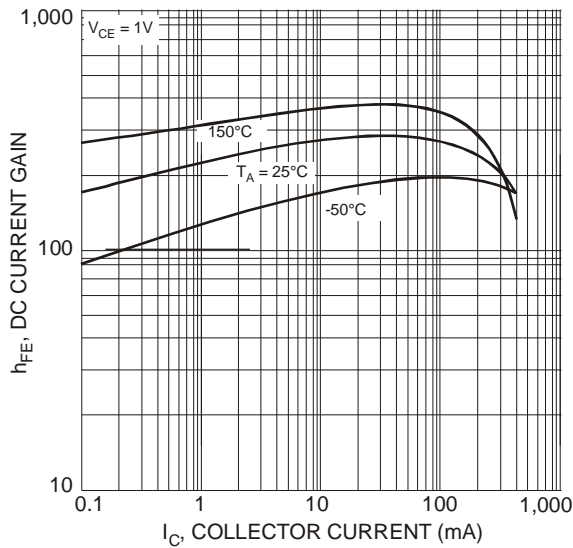


Figure 3 Typical DC Current Gain vs. Collector Current

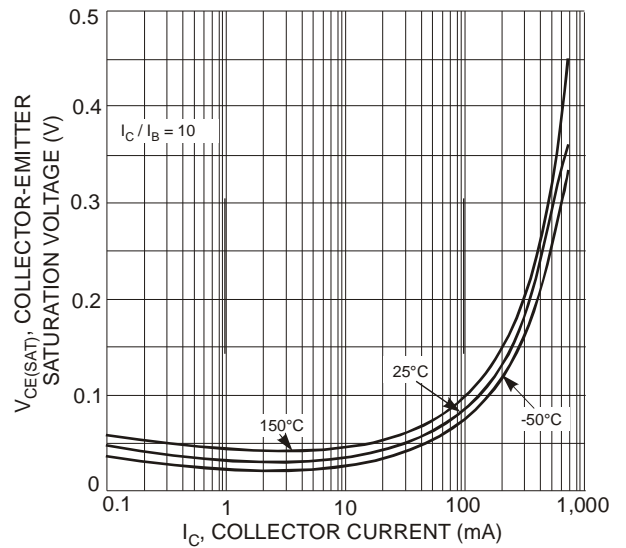


Figure 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

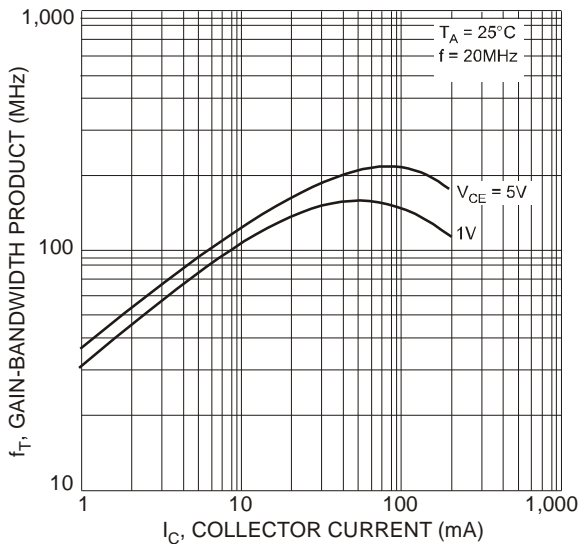
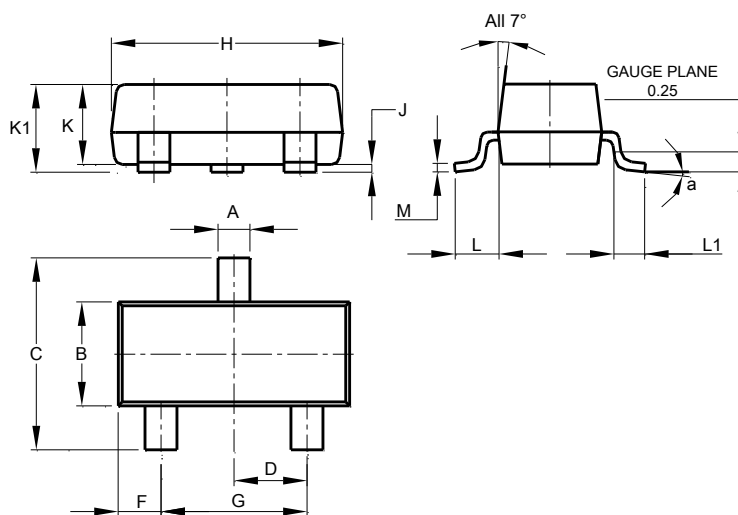


Figure 5 Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

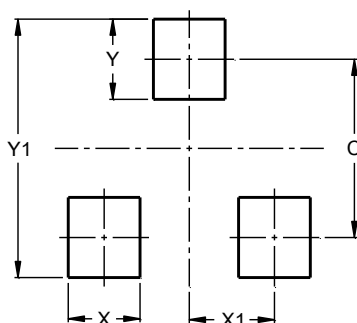
Please see AP02001 at http://www.diodes.com/_files/datasheets/ap02001.pdf for the latest version.



SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	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
H	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
a	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.



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9



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