2SC5994-TD-E Datasheet

https://www.DiGi-Electronics.com

DiGi Electronics Part Number	2SC5994-TD-E-DG
Manufacturer	onsemi
Manufacturer Product Number	2SC5994-TD-E
Description	TRANS NPN 50V 2A PCP
Detailed Description	Bipolar (BJT) Transistor NPN 50 V 2 A 420MHz 1.3 W Surface Mount PCP

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
2SC5994-TD-E	onsemi
Series:	Product Status:
-	Active
Transistor Type:	Current - Collector (Ic) (Max):
NPN	2 A
Voltage - Collector Emitter Breakdown (Max):	Vce Saturation (Max) @ Ib, Ic:
50 V	300mV @ 50mA, 1A
Current - Collector Cutoff (Max):	DC Current Gain (hFE) (Min) @ Ic, Vce:
1µA (ICBO)	200 @ 100mA, 2V
Power - Max:	Frequency - Transition:
1.3 W	420MHz
Operating Temperature:	Mounting Type:
150°C (TJ)	Surface Mount
Package / Case:	Supplier Device Package:
TO-243AA	PCP
Base Product Number:	
2SC5994	

Environmental & Export classification

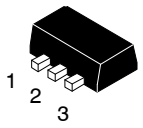
RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.29.0075	

DATA SHEET
www.onsemi.com

Bipolar Transistor

50 V, 2 A, Low V_{CE}(sat), NPN Single

2SC5994



SOT−89 / PCP−1
CASE 419AU

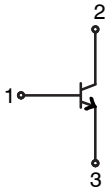
Features

- Adoption of MBIT Process
- Low Collector to Emitter Saturation Voltage
- Large Current Capacity
- High Speed Switching

Applications

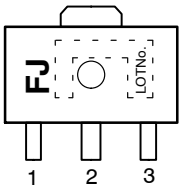
- Voltage Regulators
- Relay Drivers
- Lamp Drivers
- Electrical Equipment

ELECTRICAL CONNECTION



1: Base
2: Collector
3: Emitter

MARKING DIAGRAM



FJ = Specific Device Code

SPECIFICATIONS

ABSOLUTE MAXIMUM RATINGS at Ta = 25°C

Parameter	Symbol	Value	Unit
Collector to Base Voltage	V_{CBO}	100	V
Collector to Emitter Voltage	V_{CES}	100	V
	V_{CEO}	50	V
Emitter to Base Voltage	V_{EBO}	6	V
Collector Current	I_C	2	A
Collector Current (Pulse)	I_{CP}	4	A
Base Current	I_B	400	mA
Collector Dissipation (Note 1) T_C = 25°C	P_C	 1.3 3.5	W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	−55 to +150	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.
1. Surface mounted on ceramic substrate (450 mm^2 x 0.8 mm).

ORDERING INFORMATION

Device	Package	Shipping†
2SC5994−TD−E	SOT−89 / PCP−1	1000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

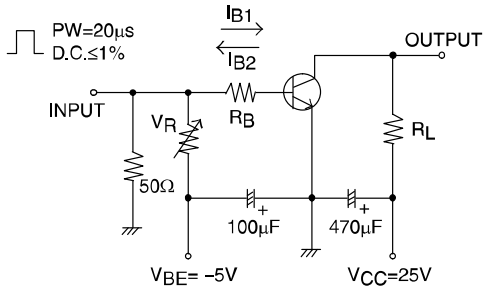
2SC5994

ELECTRICAL CHARACTERISTICS at T_A = 25°C

Parameter	Symbol	Conditions	Value			Unit
			Min	Typ	Max	
Collector Cutoff Current	I_{CBO}	V_{CB} = 50 V, I_E = 0 A			1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB} = 4 V, I_C = 0 A			1	μA
DC Current Gain	$h_{FE}1$	V_{CE} = 2 V, I_C = 100 mA	200		560	
	$h_{FE}2$	V_{CE} = 2 V, I_C = 1.5 A	40			
Gain−Bandwidth Product	f_T	V_{CE} = 10 V, I_C = 300 mA		420		MHz
Output Capacitance	Cob	V_{CB} = 10 V, f = 1 MHz		9		pF
Collector to Emitter Saturation Voltage	V_{CE}(sat)	I_C = 1 A, I_B = 50 mA		135	300	mV
Base to Emitter Saturation Voltage	V_{BE}(sat)	I_C = 1 A, I_B = 50 mA		0.9	1.2	V
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 10 μA, I_E = 0 A	100			V
Collector to Emitter Breakdown Voltage	$V_{(BR)CES}$	I_C = 100 μA, R_{BE} = 0 Ω	100			V
	$V_{(BR)CEO}$	I_C = 1 mA, R_{BE} = ∞	50			V
Emitter to Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 10 μA, I_C = 0 A	6			V
Turn−On Time	t_{on}	See specified Test Circuit		30		ns
Storage Time	t_{stg}			330		ns
Fall Time	t_f			40		ns

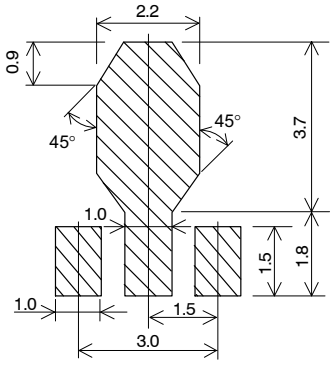
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

Switching Time Test Circuit



I_C = 10 I_{B1} = −10 I_{B2} = 700 mA

Recommended Soldering Footprint



2SC5994

TYPICAL CHARACTERISTICS

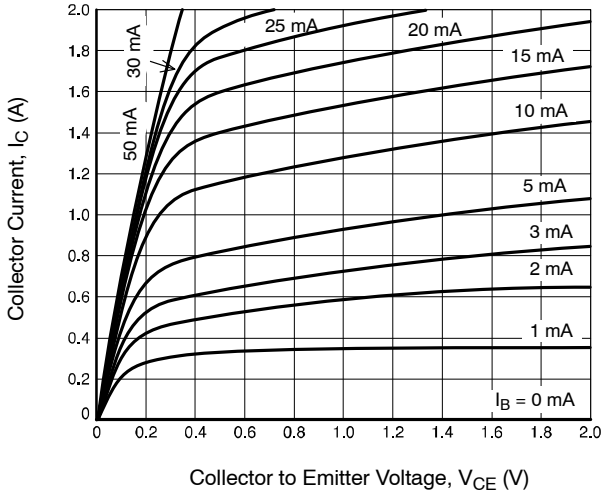


Figure 1. I_C – V_{CE}

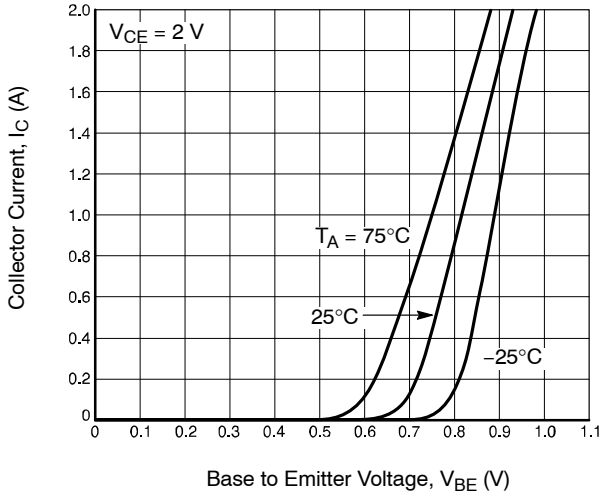


Figure 2. I_C – V_{BE}

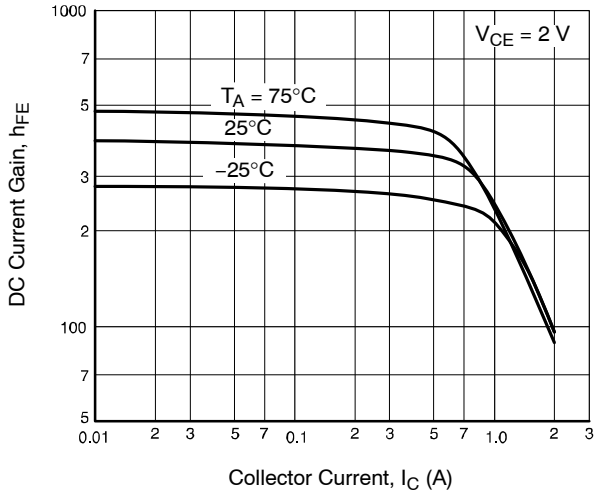


Figure 3. h_{FE} – I_C

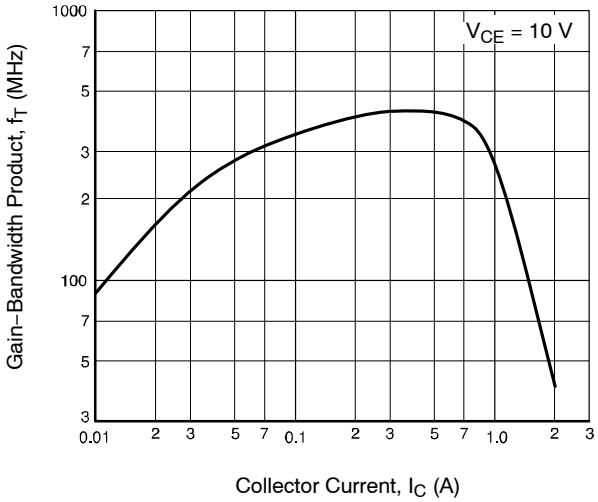


Figure 4. f_T – I_C

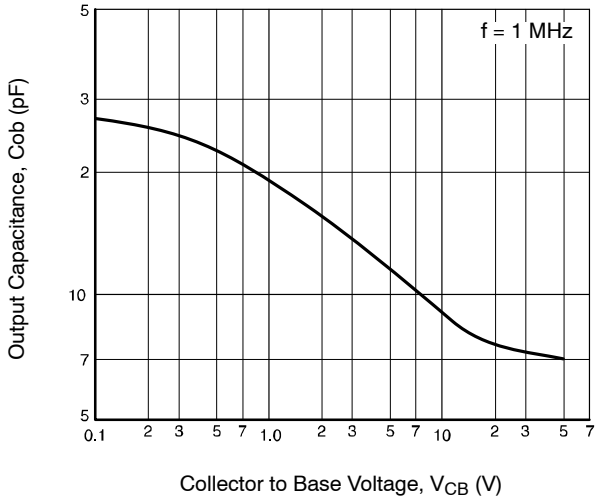


Figure 5. Cob – V_{CB}

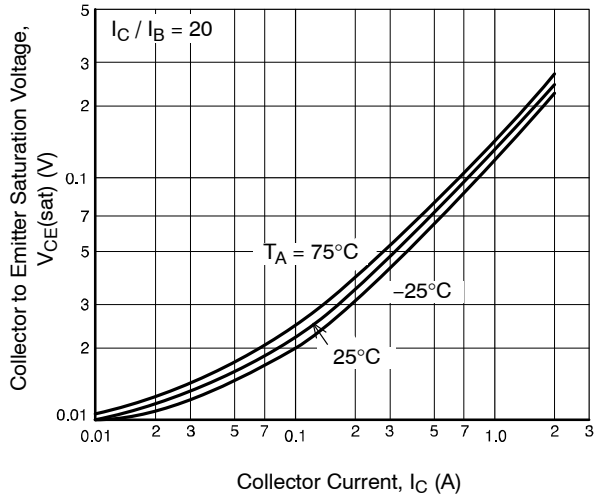


Figure 6. V_{CE}(sat) – I_C

2SC5994

TYPICAL CHARACTERISTICS (continued)

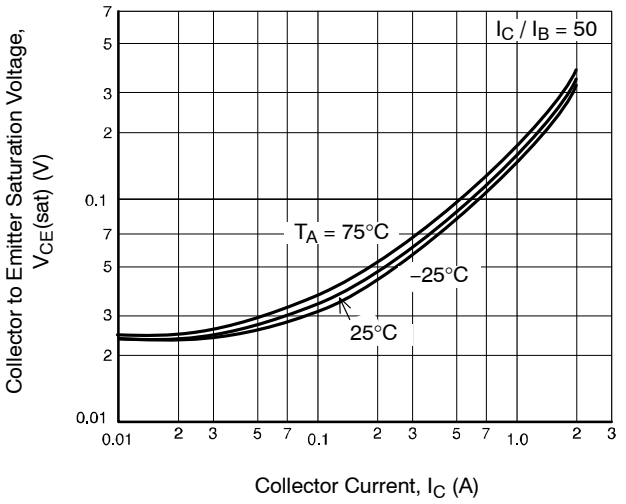


Figure 7. $V_{CE(sat)}$ – I_C

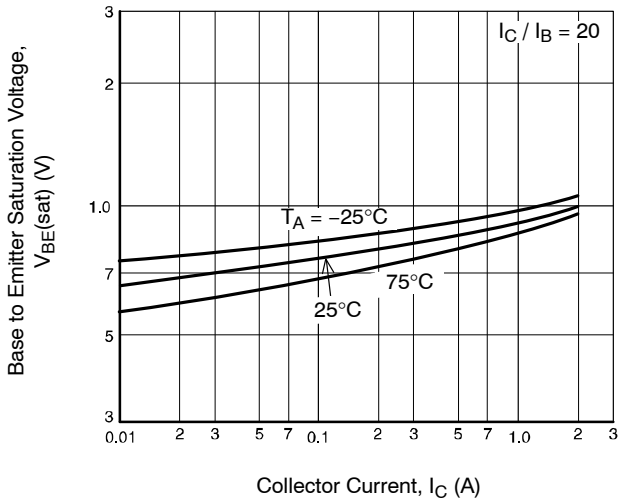


Figure 8. $V_{BE(sat)}$ – I_C

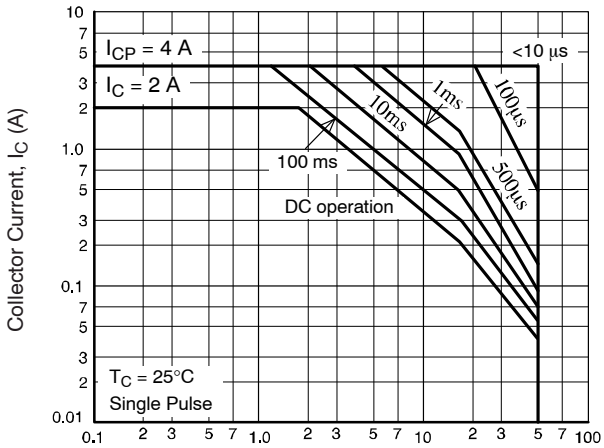


Figure 9. ASO

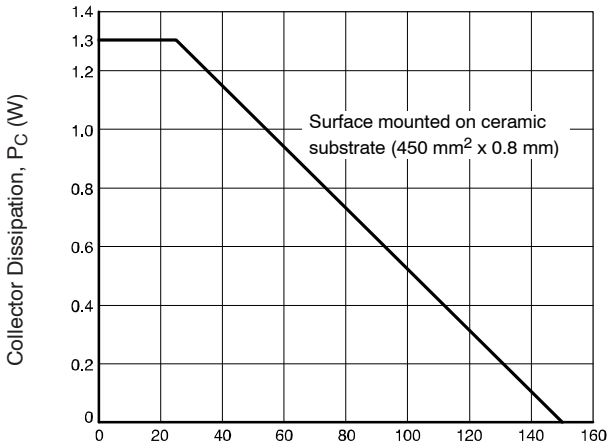


Figure 10. P_C – T_A

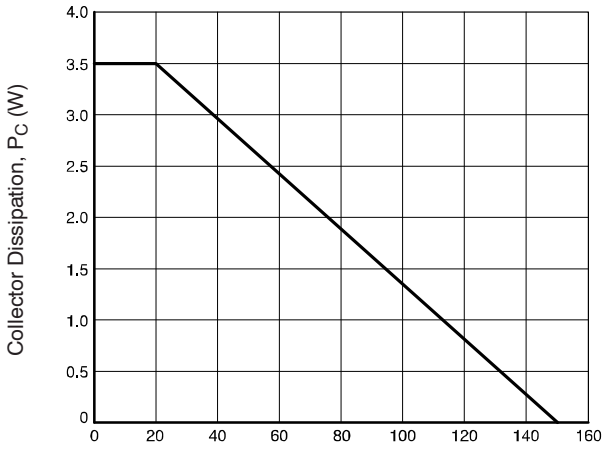
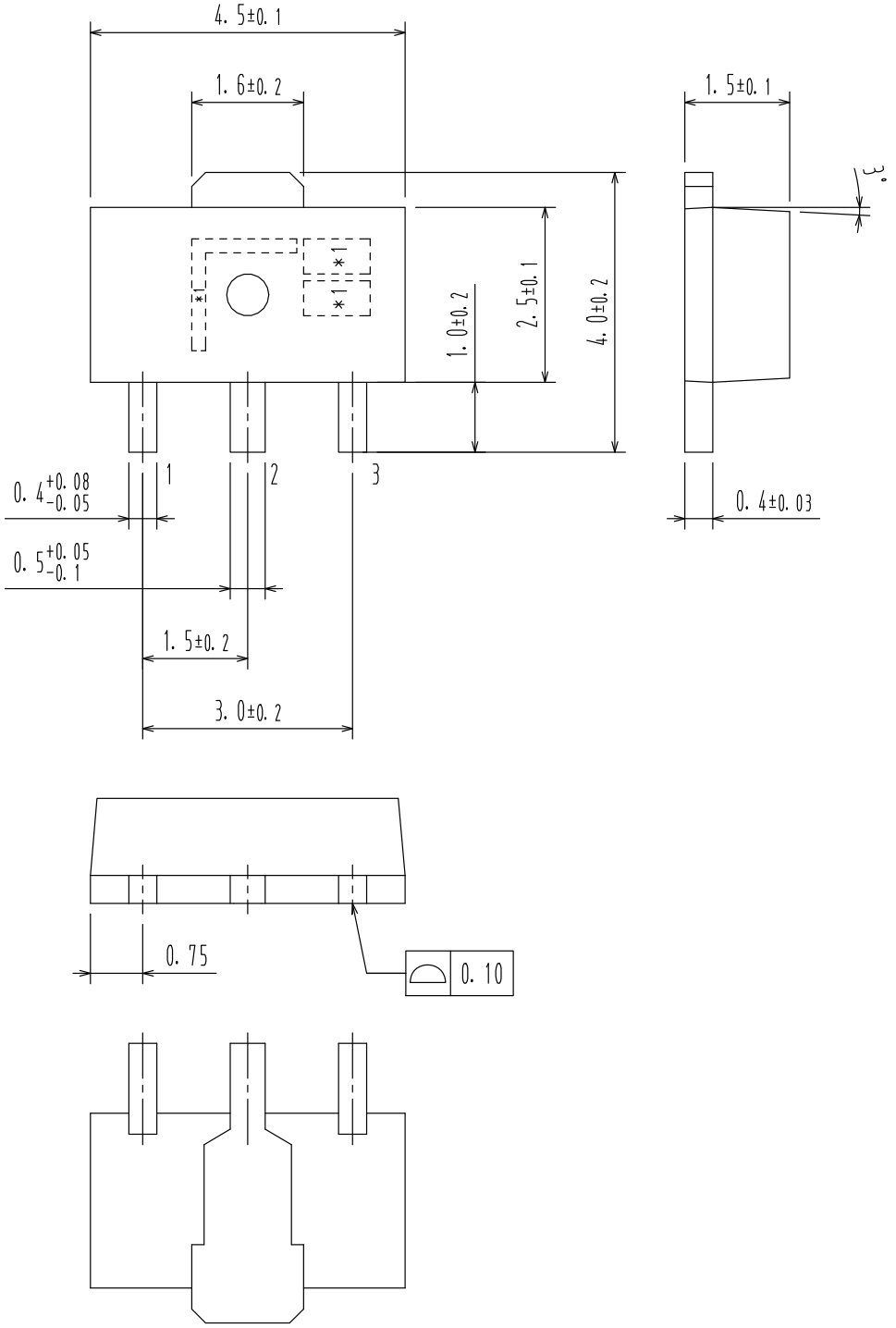


Figure 11. P_C – T_C

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

SOT−89 / PCP−1
CASE 419AU
ISSUE O

DATE 30 APR 2012



DOCUMENT NUMBER:	**98AON79746E**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	**SOT−89 / PCP−1**	**PAGE 1 OF 1**

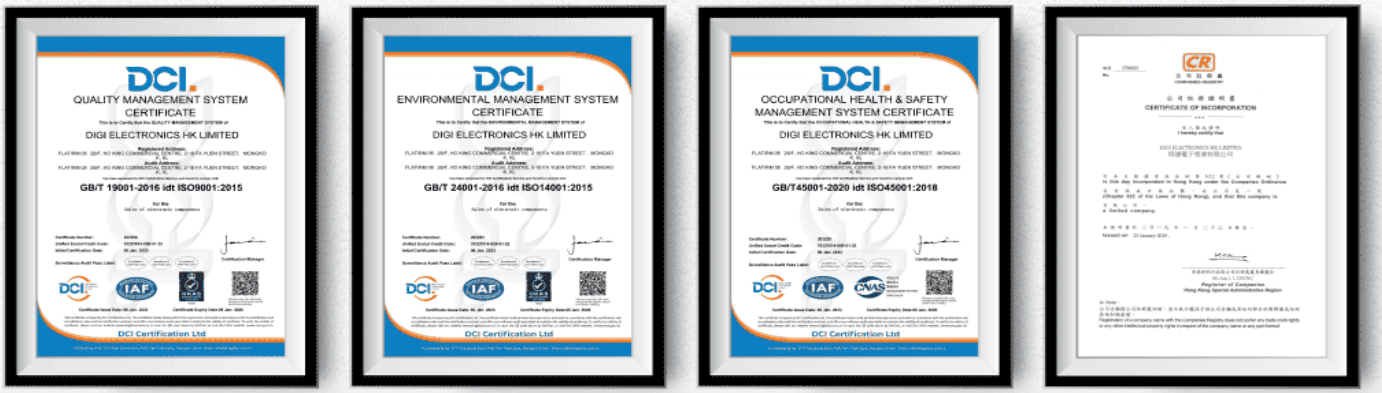
ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:
Technical Library: www.onsemi.com/design/resources/technical−documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support
For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales

OUR CERTIFICATE

DiGi provide top-quality products and perfect service for customer worldwide through standardization, technological innovation and continuous improvement. DiGi through third-party certification, we striciy control the quality of products and services. Welcome your RFQ to Email: Info@DiGi-Electronics.com



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.