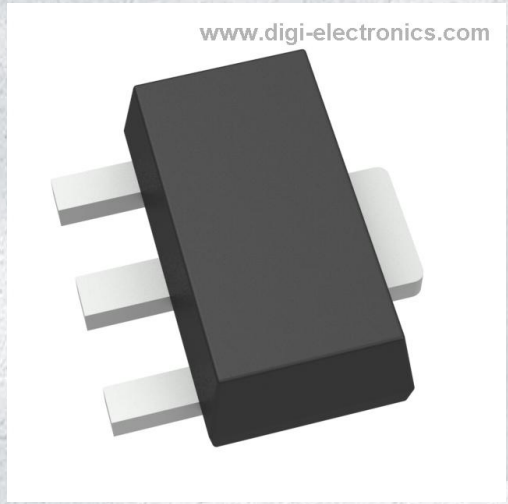
FCX1047ATA Datasheet



DiGi Electronics Part Number	FCX1047ATA-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	FCX1047ATA
Description	TRANS NPN 10V 4A SOT89-3
Detailed Description	Bipolar (BJT) Transistor NPN 10 V 4 A 150MHz 2 W Surface Mount SOT-89-3

https://www.DiGi-Electronics.com

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
FCX1047ATA	Diodes Incorporated
Series:	Product Status:
-	Active
Transistor Type:	Current - Collector (Ic) (Max):
NPN	4 A
Voltage - Collector Emitter Breakdown (Max):	Vce Saturation (Max) @ Ib, Ic:
10 V	350mV @ 25mA, 5A
Current - Collector Cutoff (Max):	DC Current Gain (hFE) (Min) @ Ic, Vce:
10nA	300 @ 1A, 2V
Power - Max:	Frequency - Transition:
2 W	150MHz
Operating Temperature:	Mounting Type:
-55°C ~ 150°C (TJ)	Surface Mount
Package / Case:	Supplier Device Package:
TO-243AA	SOT-89-3
Base Product Number:	
FCX1047	

Environmental & Export classification

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

A Product Line of
Diodes Incorporated

FCX1047A

10V NPN MEDIUM POWER TRANSISTOR IN SOT89

Features

- BV_{CEO} > 10V
- I_C = 4A High Continuous Current
- I_{CM} = 20A Peak Pulse Current
- High Gain Holds up h_{FE} > 300 @ I_C=1A
- Low Equivalent On-Resistance; $R_{CE(sat)}$ = 40mΩ at 4A
- Excellent h_{FE} Characteristics up to 20A
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

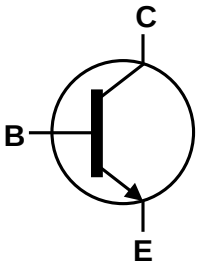
- Case: SOT89
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Lead. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.052 grams (Approximate)

Applications

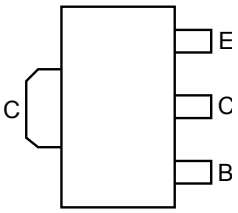
- Emergency Lighting Circuits
- Motor Driving (including DC fans)
- Solenoid, Relay and Actuator Drivers
- DC-DC Modules
- Backlight Inverters
- Power Switches
- MOSFET Gate Drivers

SOT89

Top View



Device Symbol



Top View
Pin-Out

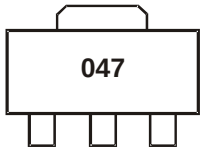
Ordering Information (Note 4)

Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FCX1047ATA	047	7	12	1,000

Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
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

SOT89



047 = Product Type Marking Code

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FCX1047A

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	35	V
Collector-Emitter Voltage	V_{CEO}	10	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	4	A
Peak Pulse Current	I_{CM}	20	A

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

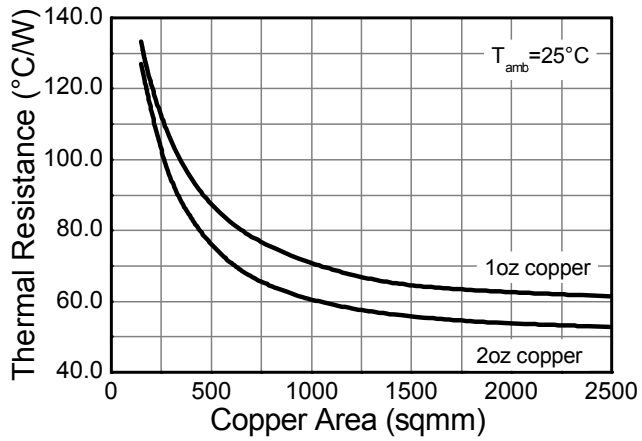
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	1	W
	(Note 6)		1.6	
	(Note 7)		2.0	
Thermal Resistance, Junction to Ambient Air	(Note 5)	$R_{\theta JA}$	125	°C/W
	(Note 6)		78	
	(Note 7)		62.5	
Thermal Resistance, Junction to Lead	(Note 8)	$R_{\theta JL}$	3.6	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

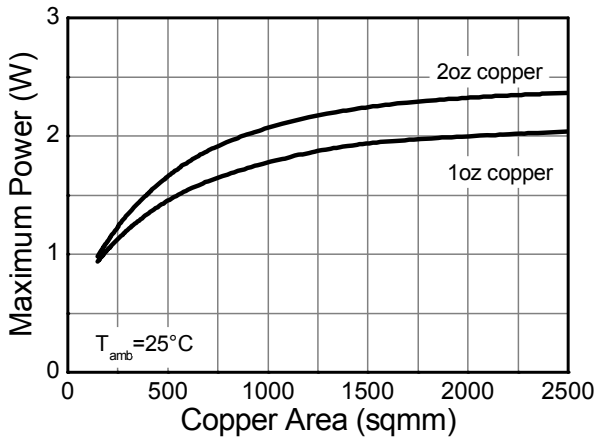
ESD Ratings (Note 9)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

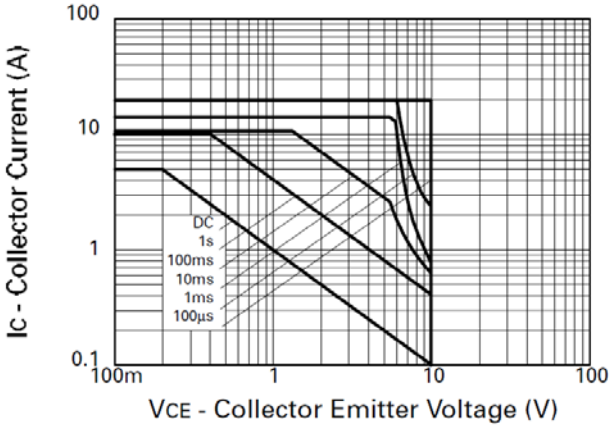
Notes:
5. For a device mounted with the exposed collector pad on 15mm x 15mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
6. Same as Note 5, except the device is mounted on 25mm x 25mm 1oz copper.
7. Same as Note 5, except the device is mounted on 50mm x 50mm 1oz copper.
8. Thermal resistance from junction to solder-point (on the exposed collector pad).
9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

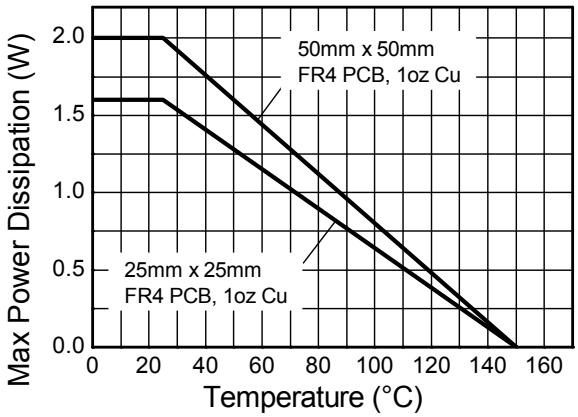




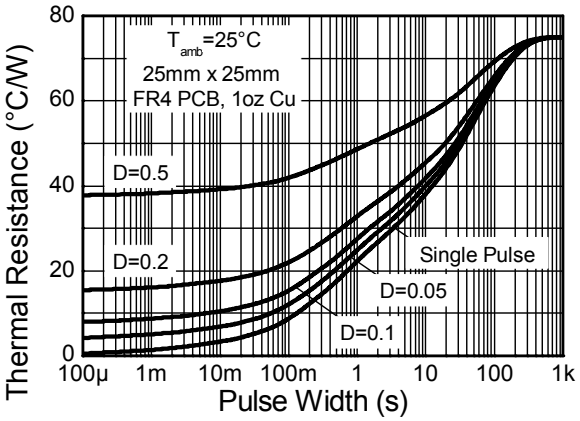
Thermal Characteristics and Derating Information (continued)



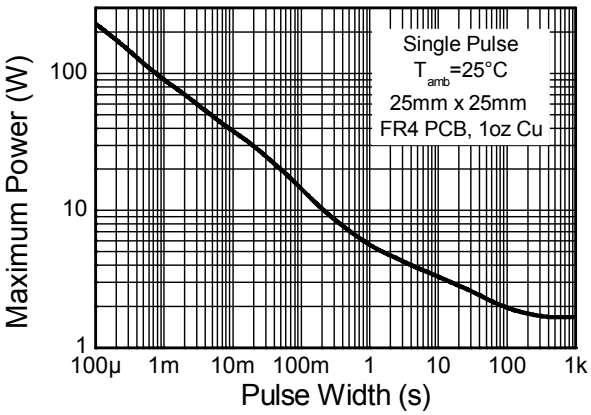
Safe Operating Area



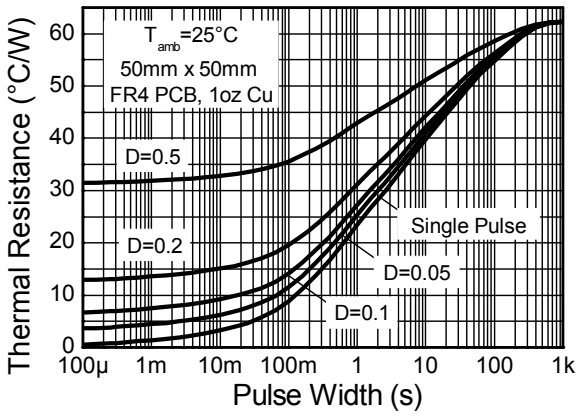
Derating Curve



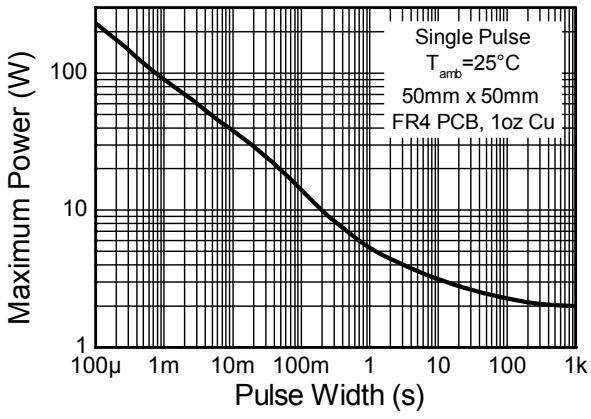
Transient Thermal Impedance



Pulse Power Dissipation



Transient Thermal Impedance



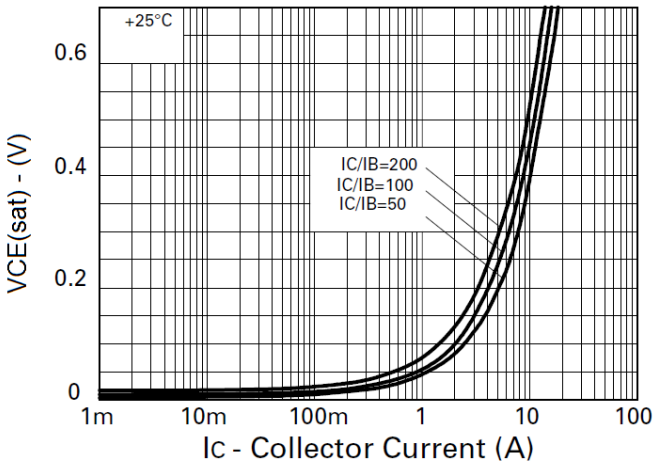
Pulse Power Dissipation

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

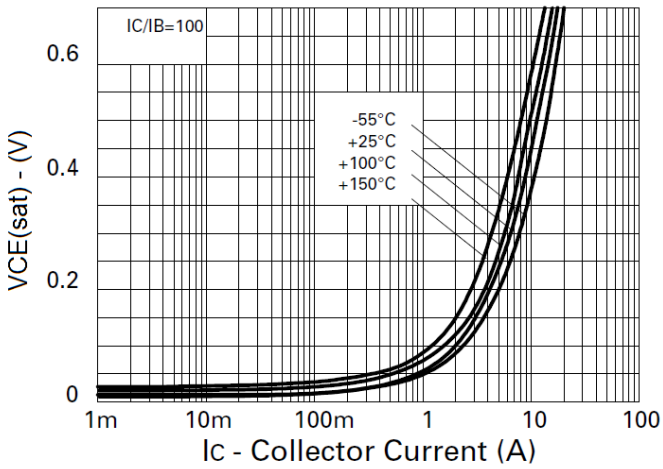
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	35	—	—	V	I_C = 100μA
Collector-Emitter Breakdown Voltage	BV_{CES}	35	—	—	V	I_C = 100μA
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	10	—	—	V	I_C = 10mA
Collector-Emitter Breakdown Voltage	BV_{CEV}	35	—	—	V	I_C = 100μA, V_{EB} = 1V
Emitter-Base Breakdown Voltage	BV_{EBO}	7	—	—	V	I_E = 100μA
Collector Cutoff Current	I_{CBO}	—	0.3	10	nA	V_{CB} = 20V
Collector Cutoff Current	I_{CES}	—	0.3	10	nA	V_{CES} = 20V
Emitter Cutoff Current	I_{EBO}	—	0.3	10	nA	V_{EB} = 5.6V
DC Current Transfer Static Ratio (Note 10)	h_{FE}	280 290 300 200 200 60	430 440 450 350 330 110	1,200	—	I_C = 10mA, V_{CE} = 2V I_C = 0.5A, V_{CE} = 2V I_C = 1A, V_{CE} =2V I_C = 4A, V_{CE} = 2V I_C = 5A, V_{CE} = 2V I_C = 20A, V_{CE} = 2V
Collector-Emitter Saturation Voltage (Note 10)	$V_{CE(sat)}$	—	25 50 140 160 220	40 70 200 240 350	mV	I_C = 0.5A, I_B = 10mA I_C = 1A, I_B = 10mA I_C = 3A, I_B = 15mA I_C = 4A, I_B = 50mA I_C = 5A, I_B = 25mA
Base-Emitter Saturation Voltage (Note 10)	$V_{BE(sat)}$	—	920	1,000	mV	I_C = 4A, I_B = 50mA
Base-Emitter Turn-on Voltage (Note 10)	$V_{BE(on)}$	—	860	950	mV	I_C = 4A, V_{CE} = 2V
Transitional Frequency	f_T	—	150	—	MHz	I_C = 50mA, V_{CE} = 10V, f = 50MHz
Output Capacitance	C_{obo}	—	85	—	pF	V_{CB} = 10V, f = 1MHz,
Switching Time	t_{on}	—	130	—	ns	V_{CC} = 10V, I_C = 4A, I_{B1} = I_{B2} = ±40mA
	t_{off}		230		ns	

Note: 10. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤ 2%.

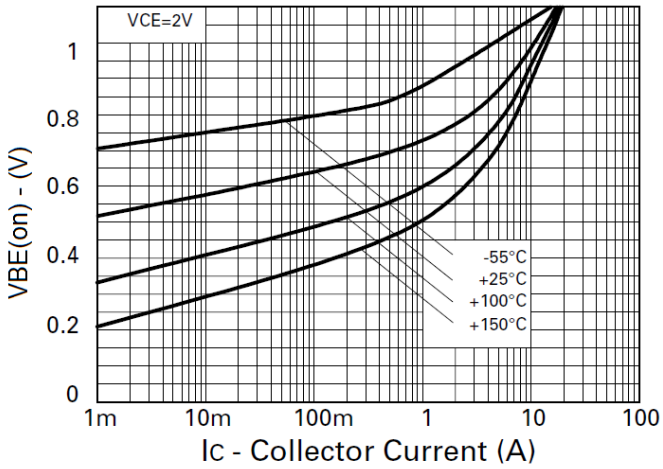
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



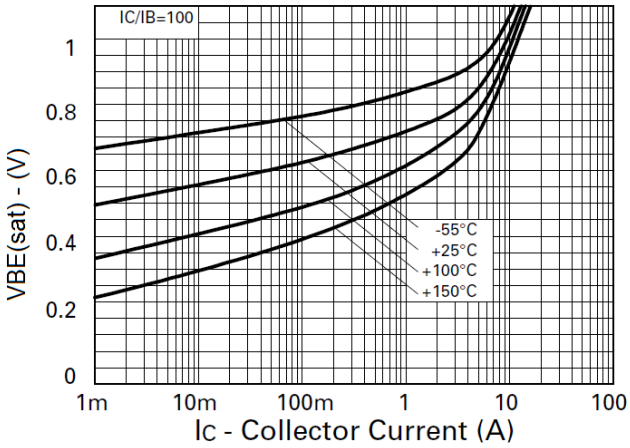
VCE(sat) v IC



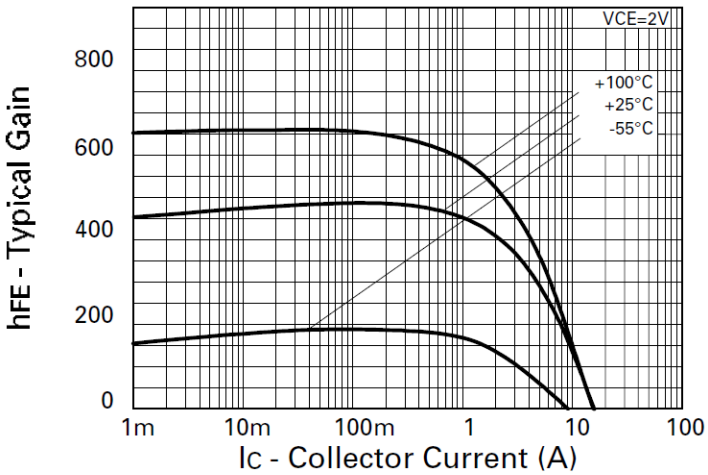
VCE(sat) v IC



VBE(on) v IC



VBE(sat) v IC



hFE v IC

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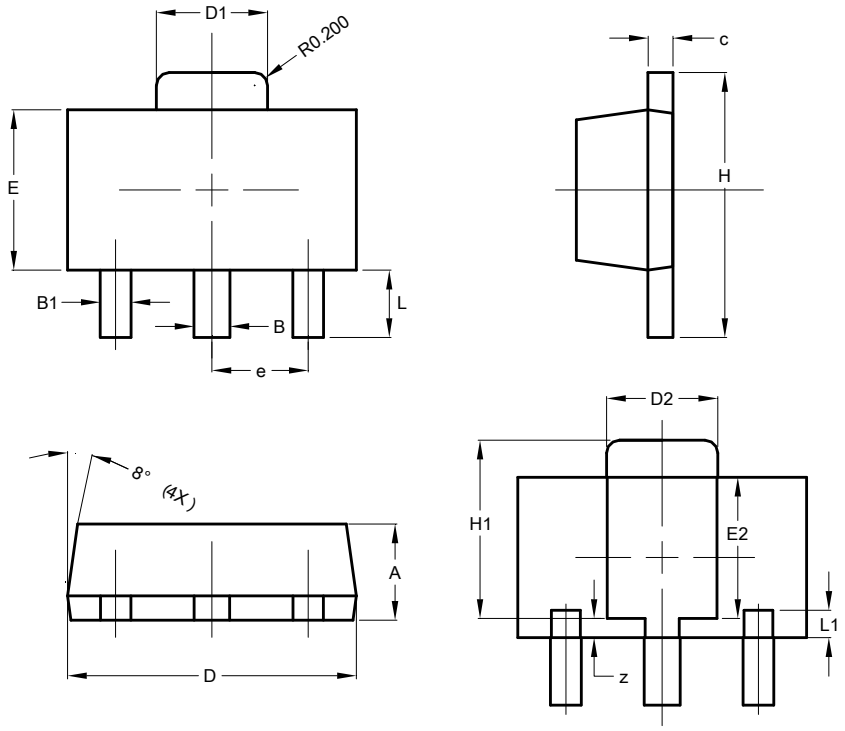
FCX1047A

Package Outline Dimensions

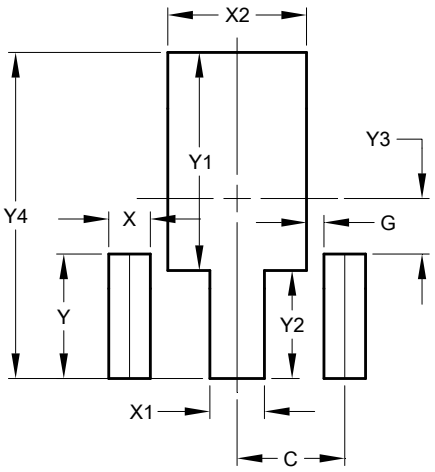
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



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	0.427 REF		
Z	0.30 REF		
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)
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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2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

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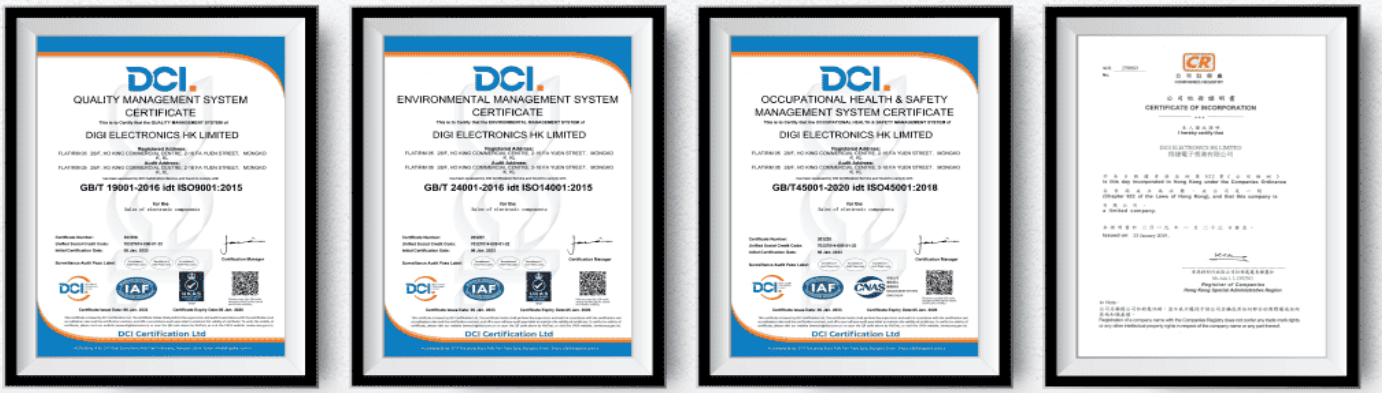

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