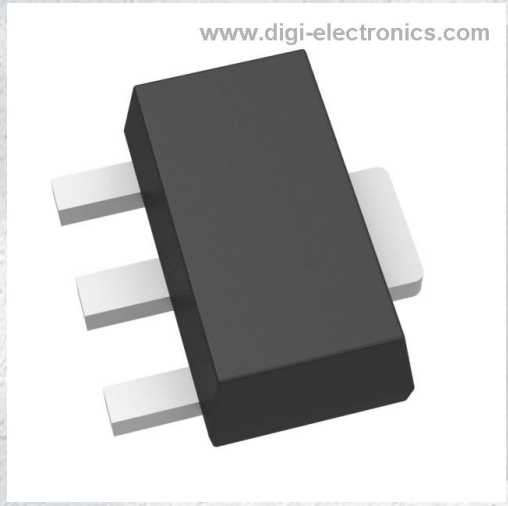
FCX1053ATA Datasheet



DiGi Electronics Part Number	FCX1053ATA-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	FCX1053ATA
Description	TRANS NPN 75V 3A SOT89-3
Detailed Description	Bipolar (BJT) Transistor NPN 75 V 3 A 140MHz 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:
FCX1053ATA	Diodes Incorporated
Series:	Product Status:
-	Active
Transistor Type:	Current - Collector (Ic) (Max):
NPN	3 A
Voltage - Collector Emitter Breakdown (Max):	Vce Saturation (Max) @ Ib, Ic:
75 V	440mV @ 200mA, 4.5A
Current - Collector Cutoff (Max):	DC Current Gain (hFE) (Min) @ Ic, Vce:
10nA	300 @ 500mA, 2V
Power - Max:	Frequency - Transition:
2 W	140MHz
Operating Temperature:	Mounting Type:
-55°C ~ 150°C (TJ)	Surface Mount
Package / Case:	Supplier Device Package:
TO-243AA	SOT-89-3
Base Product Number:	
FCX1053	

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

Lead-free Green

FCX1053A

75V NPN MEDIUM POWER TRANSISTOR IN SOT89

Features

- BV_{CEO} > 75V
- I_C = 3A high Continuous Current
- I_{CM} = 10A Peak Pulse Current
- High Gain Holds up h_{FE} > 300 @ I_C=1A
- Low Equivalent On-Resistance; $R_{CE(sat)}$ = 78mΩ at 4.5A
- Excellent hFE characteristics up to 10A
- **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**

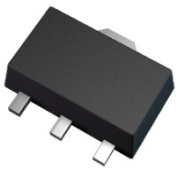
Mechanical Data

- 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 Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.052 grams (Approximate)

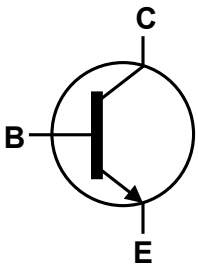
Applications

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

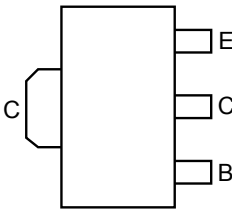
SOT89



Top View



Device Symbol



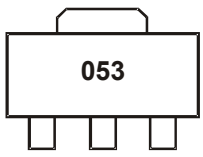
Top View
Pin-Out

Ordering Information (Note 4)

Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FCX1053ATA	053	7	12	1,000
FCX1053A-13R	053	13	12	4,000

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



053 = Product Type Marking Code

A Product Line of
Diodes Incorporated

FCX1053A

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	150	V
Collector-Emitter Voltage	V_{CEO}	75	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	3	A
Base Current	I_B	500	mA
Peak Pulse Current	I_{CM}	10	A

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

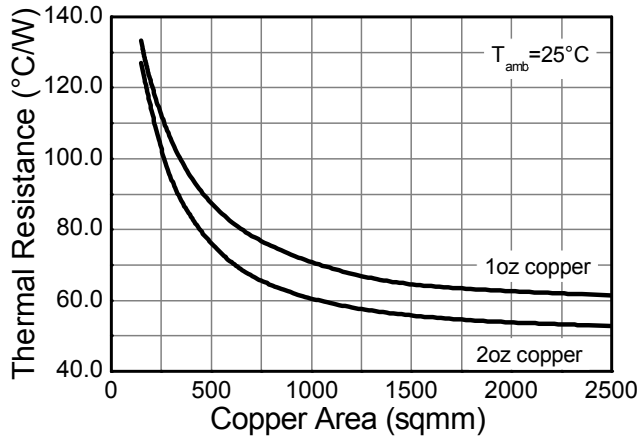
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	1	W
	(Note 6)		1.6	
	(Note 7)		2.0	
Thermal Resistance, Junction to Ambient Air	(Note 5)	$R_{\theta JA}$	125	°C/W
	(Note 6)		78	
	(Note 7)		62.5	
Thermal Resistance, Junction to Lead	(Note 8)	$R_{\theta JL}$	3.6	°C/W
Operating and Storage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

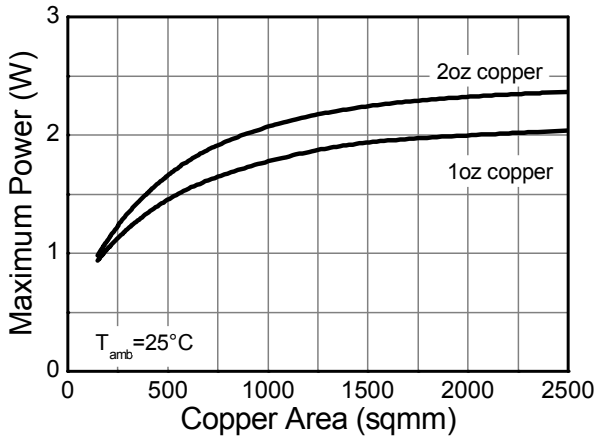
ESD Ratings (Note 9)

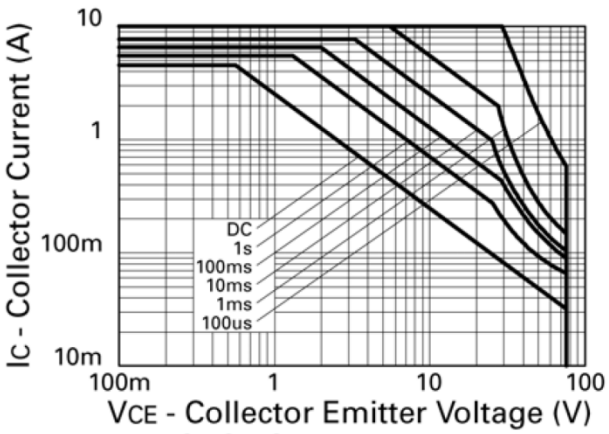
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

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.

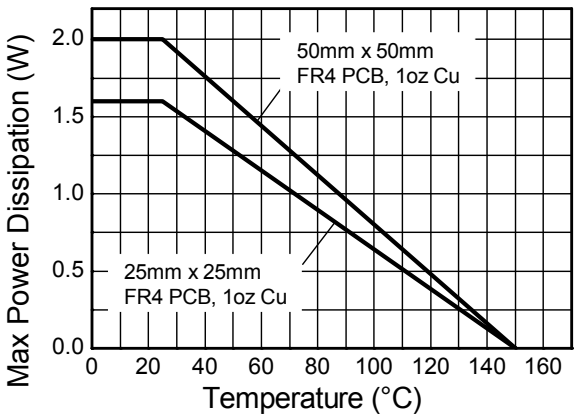
Thermal Characteristics and Derating Information



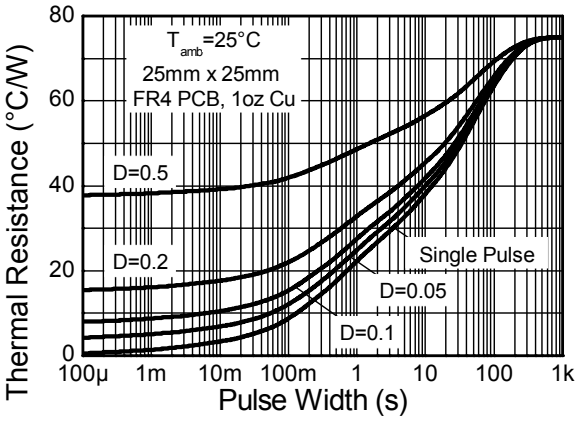




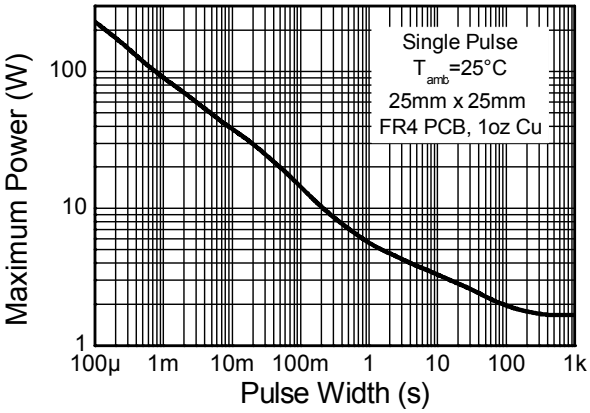
Safe Operating Area



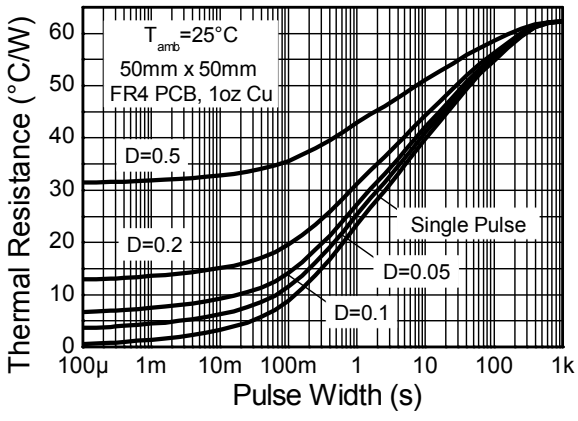
Derating Curve



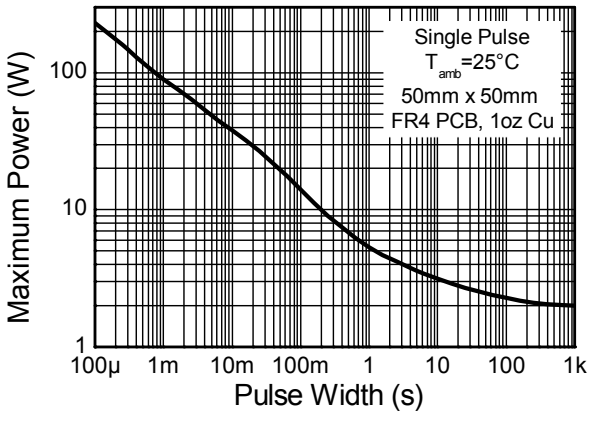
Transient Thermal Impedance



Pulse Power Dissipation



Transient Thermal Impedance



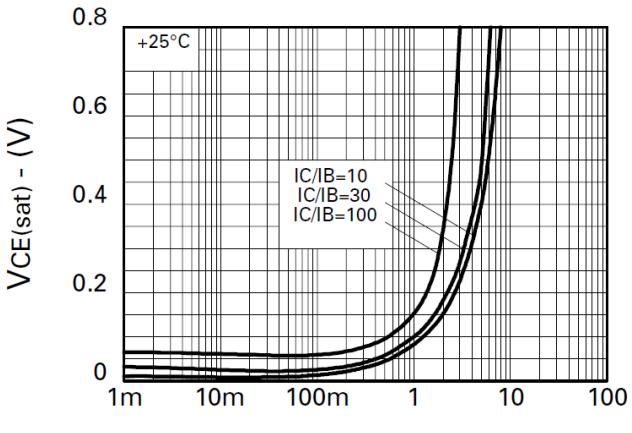
Pulse Power Dissipation

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

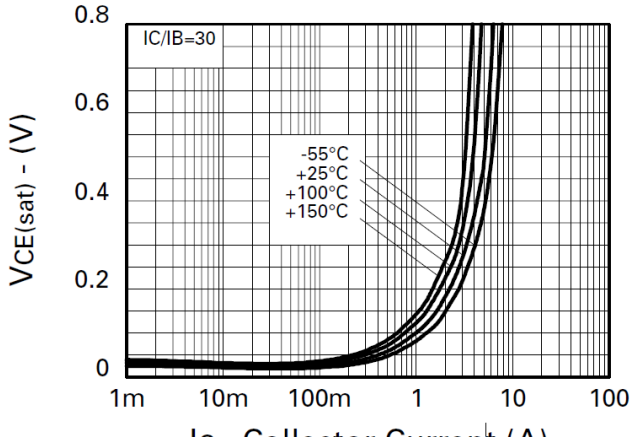
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	150	250	—	V	I_C = 100μA
Collector-Emitter Breakdown Voltage	BV_{CES}	150	250	—	V	I_C = 100μA
Collector-Emitter Breakdown Voltage (Notes 10)	BV_{CEO}	75	100	—	V	I_C = 10mA
Collector-Emitter Breakdown Voltage	BV_{CEV}	150	250	—	V	I_C = 100μA, V_{EB} = 1V
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.8	—	V	I_E = 100μA
Collector Cutoff Current	I_{CBO}	—	0.9	50	nA	V_{CB} = 120V
Collector Cutoff Current	I_{CES}	—	1.5	50	nA	V_{CES} = 120V
Emitter Cutoff Current	I_{EBO}	—	0.3	20	nA	V_{EB} = 5.6V
DC current transfer Static ratio (Notes 10)	h_{FE}	270 300 300 40	440 450 450 60 20	1200		I_C = 10mA, V_{CE} = 2V I_C = 0.5A, V_{CE} = 2V I_C = 1A, V_{CE} =2V I_C = 4.5A, V_{CE} = 2V I_C = 10A, V_{CE} = 2V
Collector-Emitter Saturation Voltage (Notes 10)	$V_{CE(sat)}$	—	21 55 150 160 350	30 75 200 210 440	mV	I_C = 0.2A, I_B = 20mA I_C = 0.5A, I_B = 20mA I_C = 1A, I_B = 10mA I_C = 2A, I_B = 100mA I_C = 4.5A, I_B = 200mA
Base-Emitter Saturation Voltage (Notes 10)	$V_{BE(sat)}$	—	900	1000	mV	I_C = 3A, I_B = 100mA
Base-Emitter Turn-on Voltage (Notes 10)	$V_{BE(on)}$	—	825	950	mV	I_C = 3A, V_{CE} = 2V
Transitional Frequency	f_T	—	140	—	MHz	I_C = 50mA, V_{CE} = 10V, f = 100MHz
Output capacitance	C_{obo}	—	21	30	pF	V_{CB} = 10V, f = 1MHz,
Switching Time	t_{on}	—	162	—	ns	V_{CC} = 50V, I_C = 2A, I_{B1} = I_{B2} = ±20mA
	t_{off}		900		ns	

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

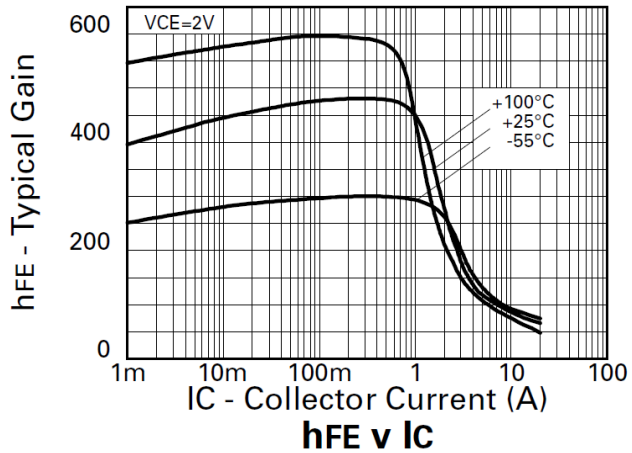
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



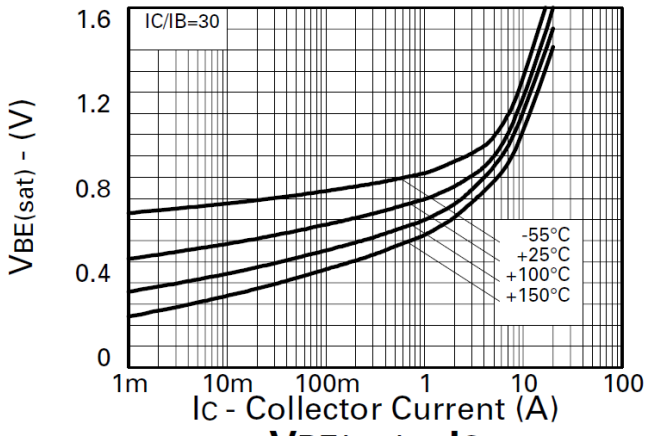
VCE(sat) v IC



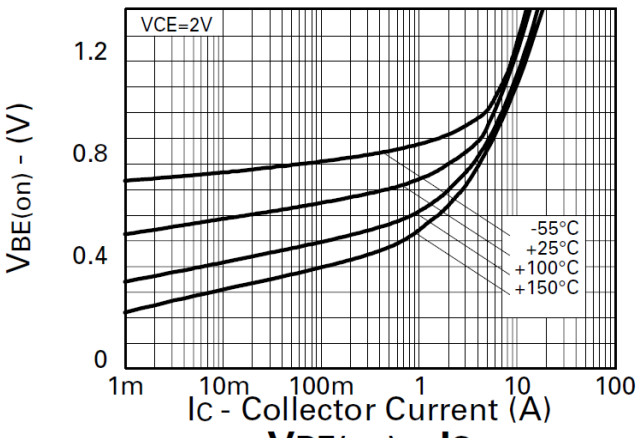
VCE(sat) v IC



hFE v IC



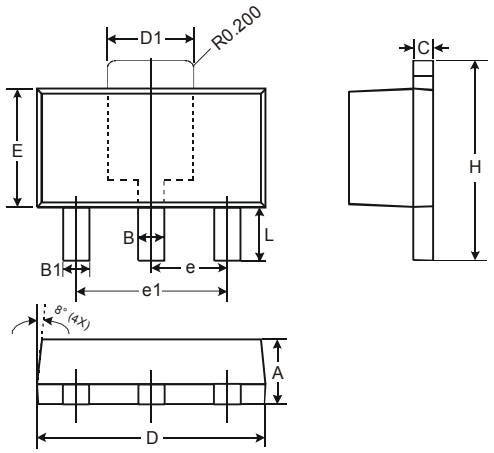
VBE(sat) v IC



VBE(on) v IC

Package Outline Dimensions

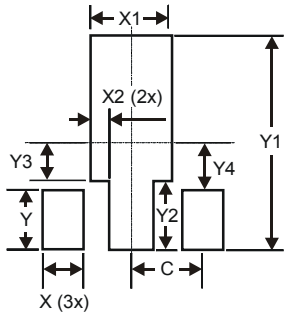
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



SOT89		
Dim	**Min**	Max
A	1.40	1.60
B	0.44	0.62
B1	0.35	0.54
C	0.35	0.43
D	4.40	4.60
D1	1.52	1.83
E	2.29	2.60
e	1.50 Typ	
e1	3.00 Typ	
H	3.94	4.25
L	0.89	1.20
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)
X	0.900
X1	1.733
X2	0.416
Y	1.300
Y1	4.600
Y2	1.475
Y3	0.950
Y4	1.125
C	1.500

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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.

B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

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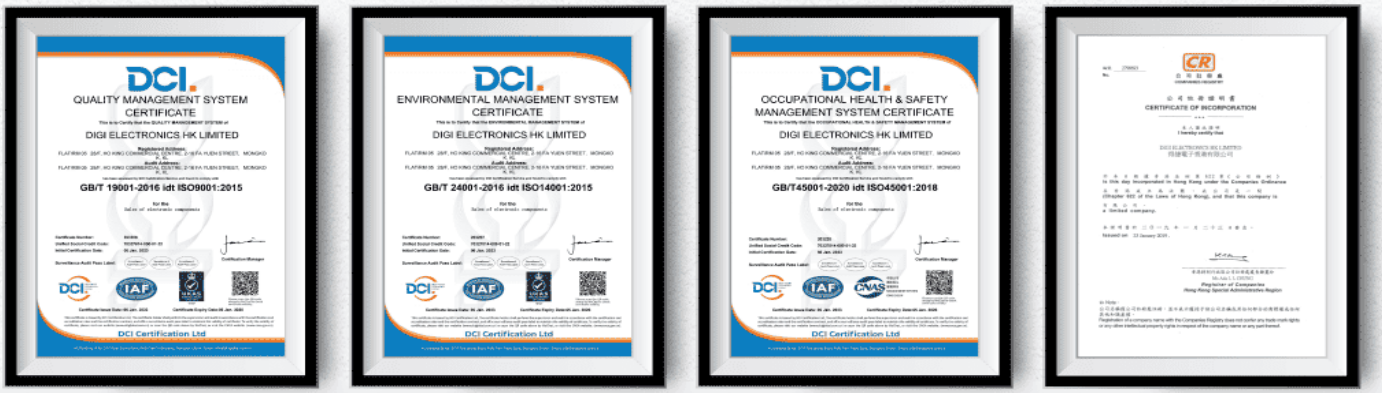

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