MJE15030G Datasheet

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DiGi Electronics Part Number	MJE15030G-DG
Manufacturer	onsemi
Manufacturer Product Number	MJE15030G
Description	TRANS NPN 150V 8A TO220
Detailed Description	Bipolar (BJT) Transistor NPN 150 V 8 A 30MHz 50 W Through Hole TO-220

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Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
MJE15030G	onsemi
Series:	Product Status:
-	Active
Transistor Type:	Current - Collector (Ic) (Max):
NPN	8 A
Voltage - Collector Emitter Breakdown (Max):	Vce Saturation (Max) @ Ib, Ic:
150 V	500mV @ 100mA, 1A
Current - Collector Cutoff (Max):	DC Current Gain (hFE) (Min) @ Ic, Vce:
100µA	20 @ 4A, 2V
Power - Max:	Frequency - Transition:
50 W	30MHz
Operating Temperature:	Mounting Type:
-65°C ~ 150°C (TJ)	Through Hole
Package / Case:	Supplier Device Package:
TO-220-3	TO-220
Base Product Number:	
MJE15030	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	Not Applicable
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.29.0075	

Complementary Silicon Plastic Power Transistors

MJE15028, MJE15030 (NPN), MJE15029, MJE15031 (PNP)

These devices are designed for use as high−frequency drivers in audio amplifiers.

Features

- High Current Gain − Bandwidth Product
- TO−220 Compact Package
- These Devices are Pb−Free and are RoHS Compliant*

MAXIMUM RATINGS

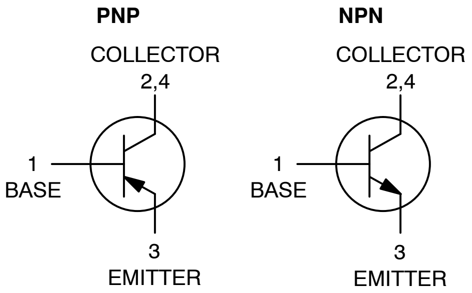
Rating	Symbol	Value	Unit
Collector−Emitter Voltage MJE15028G, MJE15029G MJE15030G, MJE15031G	V_{CEO}	 120 150	Vdc
Collector−Base Voltage MJE15028G, MJE15029G MJE15030G, MJE15031G	V_{CB}	 120 150	Vdc
Emitter−Base Voltage	V_{EB}	5.0	Vdc
Collector Current − Continuous	I_C	8.0	Adc
Collector Current − Peak	I_{CM}	16	Adc
Base Current	I_B	2.0	Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	 50 0.40	 W W/°C
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	 2.0 0.016	 W W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +150	°C

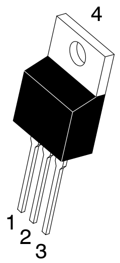
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max	Unit
Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	2.5	°C/W
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	62.5	°C/W

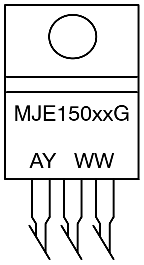
8 AMPERE POWER TRANSISTORS COMPLEMENTARY SILICON 120−150 VOLTS, 50 WATTS





**TO−220
CASE 221A
STYLE 1**

MARKING DIAGRAM



MJE150xx = Device Code
x = 28, 29, 30, or 31
A = Assembly Location
Y = Year
WW = Work Week
G = Pb−Free Package

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 5 of this data sheet.

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*For additional information on our Pb−Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector−Emitter Sustaining Voltage (Note 1) (I_C = 10 mAdc, I_B = 0) MJE15028, MJE15029 MJE15030, MJE15031	$V_{CEO(sus)}$	 120 150	 – –	Vdc
Collector Cutoff Current (V_{CE} = 120 Vdc, I_B = 0) MJE15028, MJE15029 (V_{CE} = 150 Vdc, I_B = 0) MJE15030, MJE15031	I_{CEO}	 – –	 0.1 0.1	mAdc
Collector Cutoff Current (V_{CB} = 120 Vdc, I_E = 0) MJE15028, MJE15029 (V_{CB} = 150 Vdc, I_E = 0) MJE15030, MJE15031	I_{CBO}	 – –	 10 10	μAdc
Emitter Cutoff Current (V_{BE} = 5.0 Vdc, I_C = 0)	I_{EBO}	 –	 10	μAdc
ON CHARACTERISTICS (Note 1)				
DC Current Gain (I_C = 0.1 Adc, V_{CE} = 2.0 Vdc) (I_C = 2.0 Adc, V_{CE} = 2.0 Vdc) (I_C = 3.0 Adc, V_{CE} = 2.0 Vdc) (I_C = 4.0 Adc, V_{CE} = 2.0 Vdc)	h_{FE}	 40 40 40 20	 – – – –	–
DC Current Gain Linearity (V_{CE} From 2.0 V to 20 V, I_C From 0.1 A to 3 A) (NPN to PNP)	h_{FE}	**Typ** 2 3		
Collector−Emitter Saturation Voltage (I_C = 1.0 Adc, I_B = 0.1 Adc)	$V_{CE(sat)}$	 –	 0.5	Vdc
Base−Emitter On Voltage (I_C = 1.0 Adc, V_{CE} = 2.0 Vdc)	$V_{BE(on)}$	 –	 1.0	Vdc
DYNAMIC CHARACTERISTICS				
Current Gain − Bandwidth Product (Note 2) (I_C = 500 mAdc, V_{CE} = 10 Vdc, f_{test} = 10 MHz)	f_T	 30	 –	MHz

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.

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.
2. $f_T = |h_{fe}| \bullet f_{test}$.

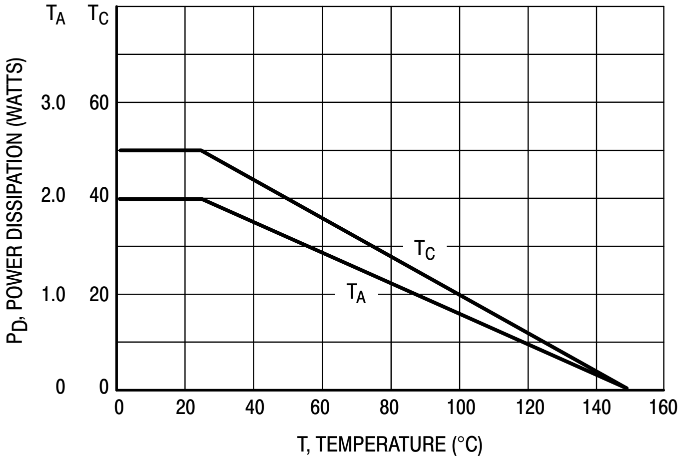


Figure 1. Power Derating

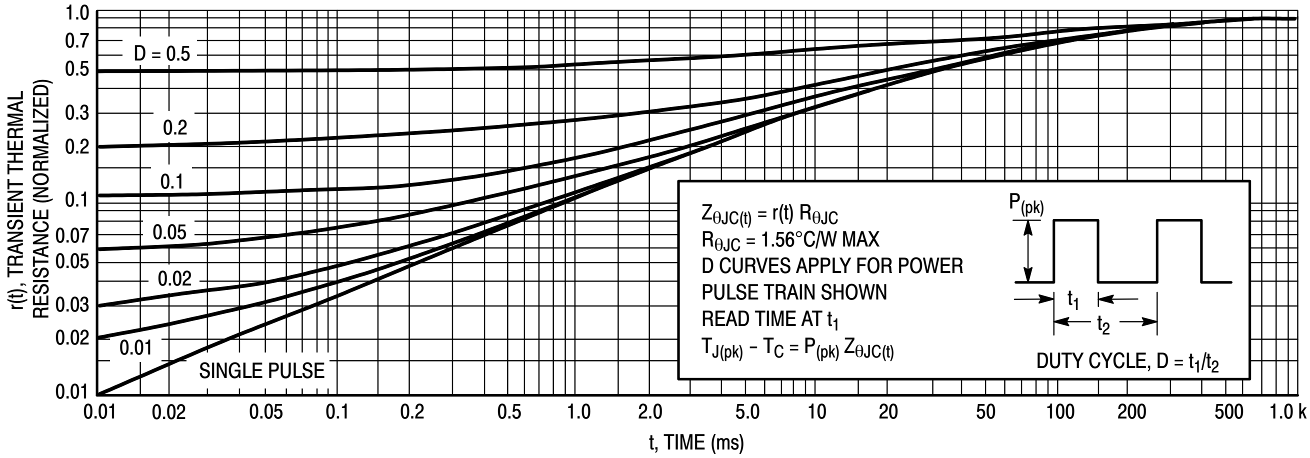


Figure 2. Thermal Response

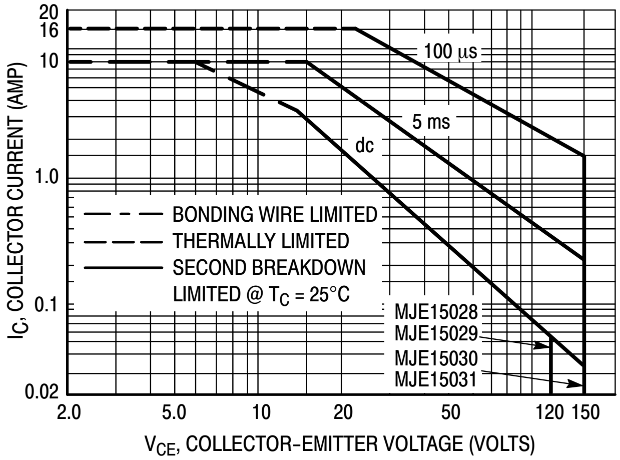


Figure 3. Forward Bias Safe Operating Area

There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation, i.e., the transistor must not be subjected to greater dissipation then the curves indicate.

The data of Figures 3 and 4 is based on $T_{J(pk)} = 150°C$; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(pk)} < 150°C$. $T_{J(pk)}$ may be calculated from the data in Figure 2. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

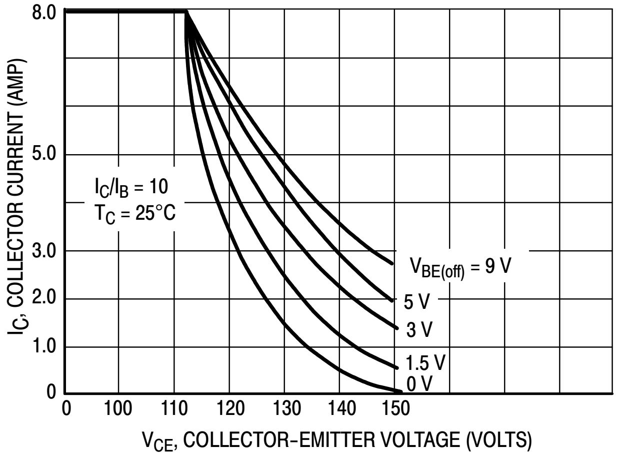


Figure 4. Reverse−Bias Switching Safe Operating Area

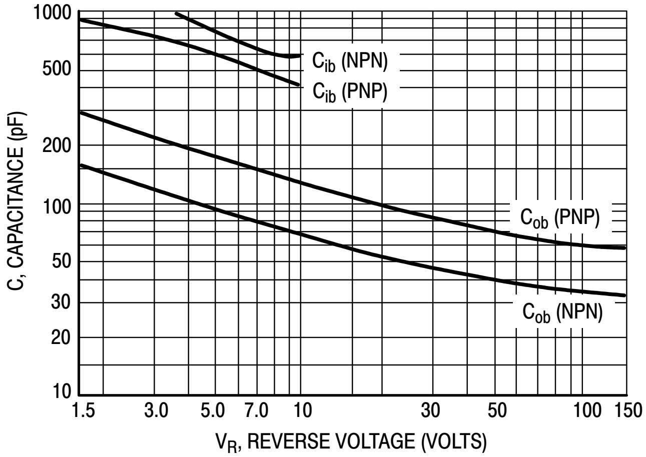


Figure 5. Capacitances

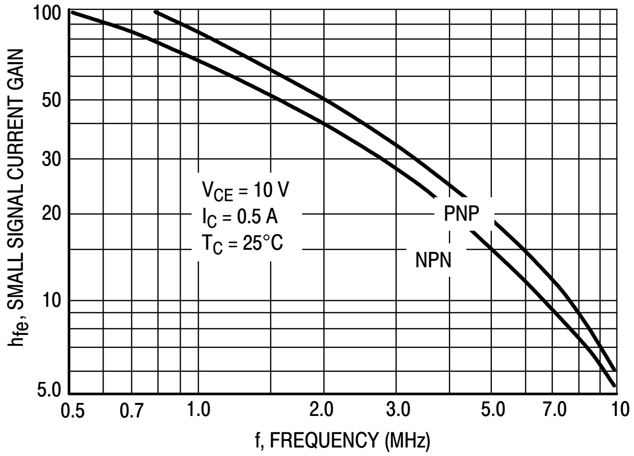


Figure 6. Small−Signal Current Gain

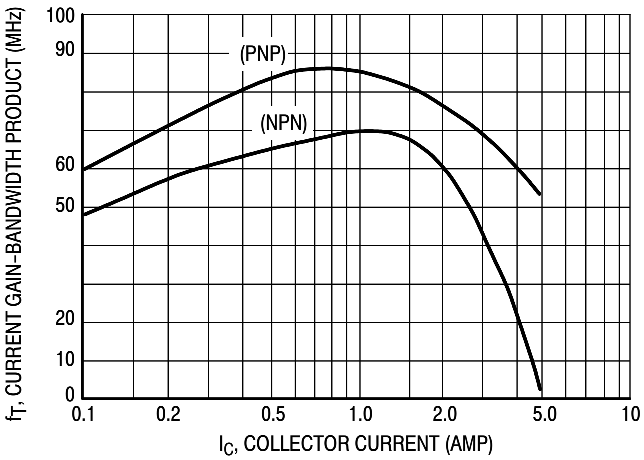
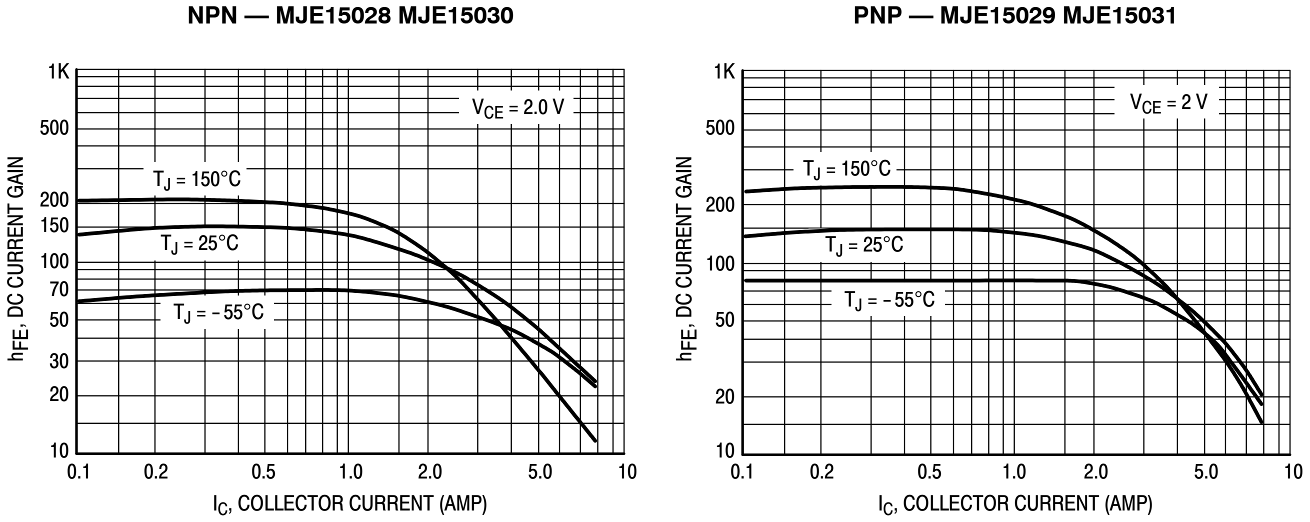
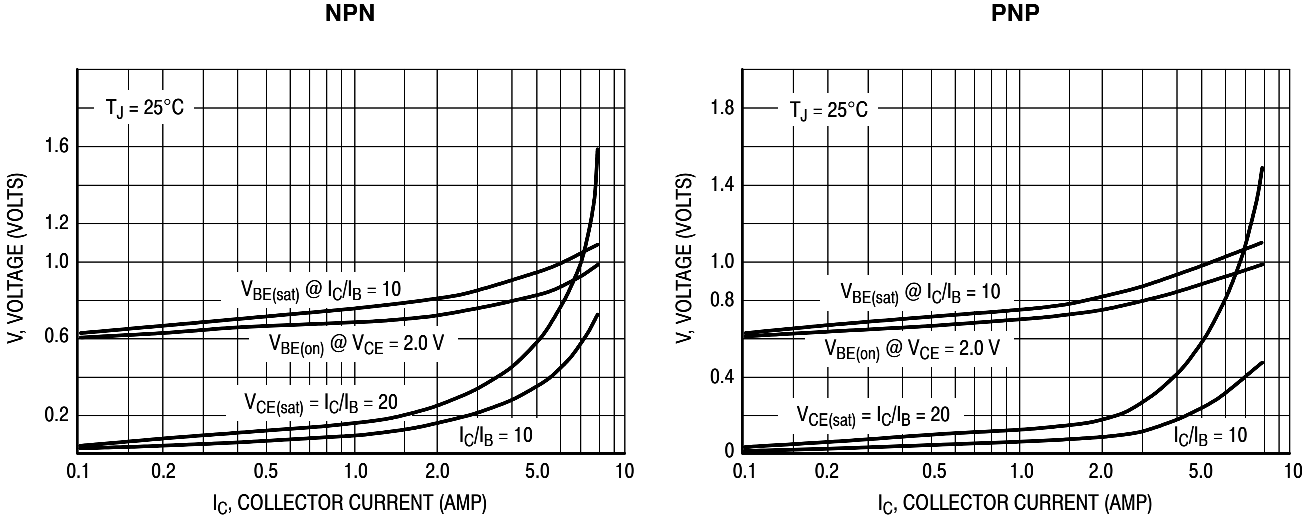


Figure 7. Current Gain−Bandwidth Product


NPN — MJE15028 MJE15030

PNP — MJE15029 MJE15031

Figure 8. DC Current Gain


NPN

PNP

Figure 9. “On” Voltage

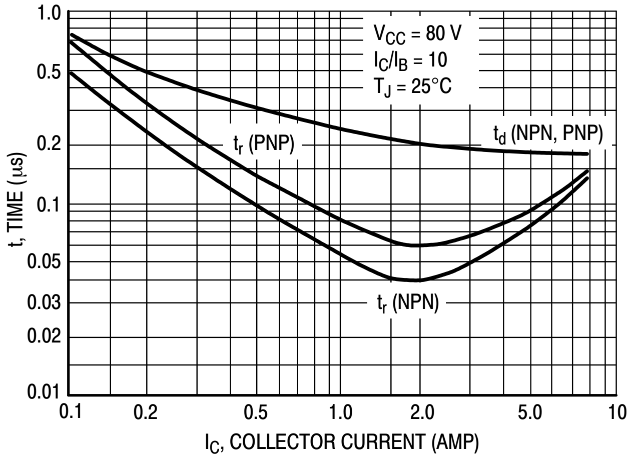


Figure 10. Turn−On Times

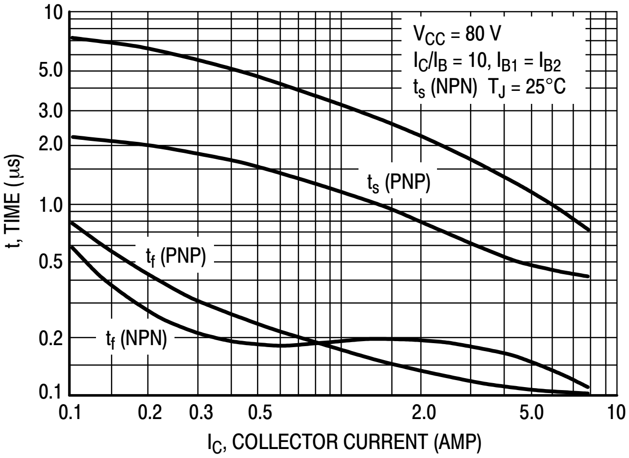


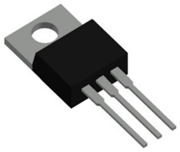
Figure 11. Turn−Off Times

ORDERING INFORMATION

Device	Package	Shipping
MJE15028G	TO−220 (Pb−Free)	50 Units / Rail
MJE15029G	TO−220 (Pb−Free)	50 Units / Rail
MJE15030G	TO−220 (Pb−Free)	50 Units / Rail
MJE15031G	TO−220 (Pb−Free)	50 Units / Rail

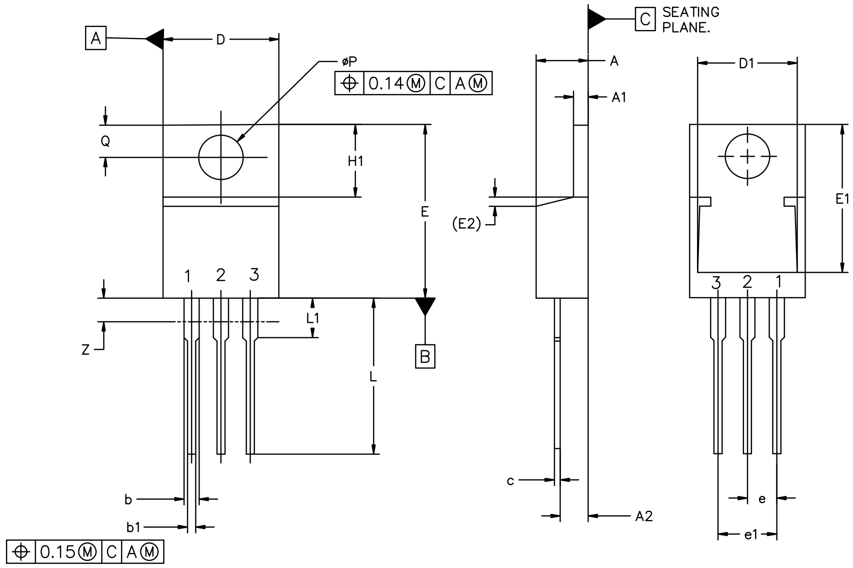
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS



TO−220−3 10.10x15.12x4.45, 2.54P
CASE 221A
ISSUE AL

DATE 05 FEB 2025



MILLIMETERS			
DIM	MIN	NOM	MAX
A	4.07	4.45	4.83
A1	1.15	1.28	1.41
A2	2.04	2.42	2.79
b	1.15	1.34	1.52
b1	0.64	0.80	0.96
c	0.36	0.49	0.61
D	9.66	10.10	10.53
D1	8.43	8.63	8.83
E	14.48	15.12	15.75
E1	12.58	12.78	12.98
E2	1.27 REF		

MILLIMETERS			
DIM	MIN	NOM	MAX
e	2.42	2.54	2.66
e1	4.83	5.08	5.33
H1	5.97	6.22	6.47
L	12.70	13.49	14.27
L1	2.80	3.45	4.10
Q	2.54	2.79	3.04
øP	3.60	3.85	4.09
Z	−.−−	−.−−	3.48

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

STYLE 1:
PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

STYLE 2:
PIN 1. BASE
2. EMITTER
3. COLLECTOR
4. EMITTER

STYLE 3:
PIN 1. CATHODE
2. ANODE
3. GATE
4. ANODE

STYLE 4:
PIN 1. MAIN TERMINAL 1
2. MAIN TERMINAL 2
3. GATE
4. MAIN TERMINAL 2

STYLE 5:
PIN 1. GATE
2. DRAIN
3. SOURCE
4. DRAIN

STYLE 6:
PIN 1. ANODE
2. CATHODE
3. ANODE
4. CATHODE

STYLE 7:
PIN 1. CATHODE
2. ANODE
3. CATHODE
4. ANODE

STYLE 8:
PIN 1. CATHODE
2. ANODE
3. EXTERNAL TRIP/DELAY
4. ANODE

STYLE 9:
PIN 1. GATE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

STYLE 10:
PIN 1. GATE
2. SOURCE
3. DRAIN
4. SOURCE

STYLE 11:
PIN 1. DRAIN
2. SOURCE
3. GATE
4. SOURCE

STYLE 12:
PIN 1. MAIN TERMINAL 1
2. MAIN TERMINAL 2
3. GATE
4. NOT CONNECTED

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DESCRIPTION:	**TO−220−3 10.10x15.12x4.45, 2.54P**	**PAGE 1 OF 1**

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CR
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I hereby certify that
is this day incorporated in Hong Kong under the Companies Ordinance (Chapter 622 of the Laws of Hong Kong), and that this company is a limited company.
Registrar of Companies
Hong Kong Special Administrative Region


ASA
MEMBERSHIP
Certificate
The Aviation Suppliers Association has enrolled as a Regular Member
DIGI ELECTRONICS HK LIMITED
Michele Dickstein
President


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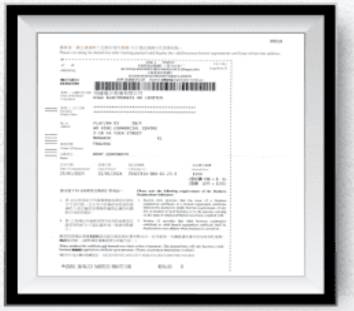

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