MJW1302AG Datasheet

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DiGi Electronics Part Number	MJW1302AG-DG
Manufacturer	onsemi
Manufacturer Product Number	MJW1302AG
Description	TRANS PNP 230V 15A TO247-3
Detailed Description	Bipolar (BJT) Transistor PNP 230 V 15 A 30MHz 200 W Through Hole TO-247-3

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Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
MJW1302AG	onsemi
Series:	Product Status:
-	Active
Transistor Type:	Current - Collector (Ic) (Max):
PNP	15 A
Voltage - Collector Emitter Breakdown (Max):	Vce Saturation (Max) @ Ib, Ic:
230 V	2V @ 1A, 10A
Current - Collector Cutoff (Max):	DC Current Gain (hFE) (Min) @ Ic, Vce:
50µA (ICBO)	50 @ 7A, 5V
Power - Max:	Frequency - Transition:
200 W	30MHz
Operating Temperature:	Mounting Type:
-65°C ~ 150°C (TJ)	Through Hole
Package / Case:	Supplier Device Package:
TO-247-3	TO-247-3
Base Product Number:	
MJW1302	

Environmental & Export classification

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

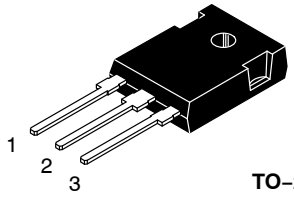
onsemi

DATA SHEET
www.onsemi.com

Complementary NPN-PNP Silicon Power Bipolar Transistors

MJW3281A (NPN) MJW1302A (PNP)

15 AMPERES COMPLEMENTARY SILICON POWER TRANSISTORS 230 VOLTS 200 WATTS



TO−247
CASE 340L

The MJW3281A and MJW1302A are PowerBase power transistors for high power audio, disk head positioners and other linear applications.

Features

- Designed for 100 W Audio Frequency
- Gain Complementary:
  Gain Linearity from 100 mA to 7 A
  h_{FE} = 45 (Min) @ I_C = 8 A
- Low Harmonic Distortion
- High Safe Operation Area − 1 A/100 V @ 1 Second
- High f_T − 30 MHz Typical
- Pb−Free Packages are Available*

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Collector−Emitter Voltage	V_{CEO}	230	Vdc
Collector−Base Voltage	V_{CBO}	230	Vdc
Emitter−Base Voltage	V_{EBO}	5.0	Vdc
Collector−Emitter Voltage − 1.5 V	V_{CEX}	230	Vdc
Collector Current − Continuous − Peak (Note 1)	I_C	15 25	Adc
Base Current − Continuous	I_B	1.5	Adc
Total Power Dissipation @ T_C = 25°C Derate Above 25°C	P_D	200 1.43	W W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	− 65 to +150	°C

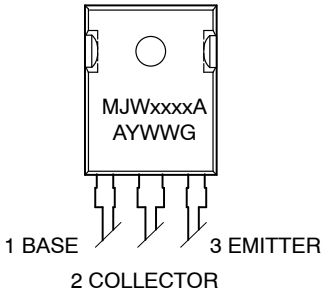
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	0.625	°C/W
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	40	°C/W

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. Pulse Test: Pulse Width = 5 ms, Duty Cycle < 10%.

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

MARKING DIAGRAM



xxxx = 3281 or 1302
A = Assembly Location
Y = Year
WW = Work Week
G = Pb−Free Package

ORDERING INFORMATION

Device	Package	Shipping
MJW3281A	TO−247	30 Units/Rail
MJW3281AG	TO−247 (Pb−Free)	30 Units/Rail
MJW1302A	TO−247	30 Units/Rail
MJW1302AG	TO−247 (Pb−Free)	30 Units/Rail

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MJW3281A (NPN) MJW1302A (PNP)

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector−Emitter Sustaining Voltage (I_C = 100 mAdc, I_B = 0)	$V_{CEO(sus)}$	230	–	–	Vdc
Collector Cutoff Current (V_{CB} = 230 Vdc, I_E = 0)	I_{CBO}	–	–	50	μAdc
Emitter Cutoff Current (V_{EB} = 5 Vdc, I_C = 0)	I_{EBO}	–	–	5	μAdc
SECOND BREAKDOWN					
Second Breakdown Collector with Base Forward Biased (V_{CE} = 50 Vdc, t = 1 s (non−repetitive) (V_{CE} = 100 Vdc, t = 1 s (non−repetitive)	$I_{S/b}$	 4 1	 – –	 – –	Adc
ON CHARACTERISTICS					
DC Current Gain (I_C = 100 mAdc, V_{CE} = 5 Vdc) (I_C = 1 Adc, V_{CE} = 5 Vdc) (I_C = 3 Adc, V_{CE} = 5 Vdc) (I_C = 5 Adc, V_{CE} = 5 Vdc) (I_C = 7 Adc, V_{CE} = 5 Vdc) (I_C = 8 Adc, V_{CE} = 5 Vdc) (I_C = 15 Adc, V_{CE} = 5 Vdc)	h_{FE}	 50 50 50 50 50 45 12	 125 – – – 115 – 35	 200 200 200 200 200 – –	–
Collector−Emitter Saturation Voltage (I_C = 10 Adc, I_B = 1 Adc)	$V_{CE(sat)}$	–	0.4	2	Vdc
Base−Emitter On Voltage (I_C = 8 Adc, V_{CE} = 5 Vdc)	$V_{BE(on)}$	–	–	2	Vdc
DYNAMIC CHARACTERISTICS					
Current−Gain − Bandwidth Product (I_C = 1 Adc, V_{CE} = 5 Vdc, f_{test} = 1 MHz)	f_T	–	30	–	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f_{test} = 1 MHz)	C_{ob}	–	–	600	pF

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.

MJW3281A (NPN) MJW1302A (PNP)

PNP MJW1302A

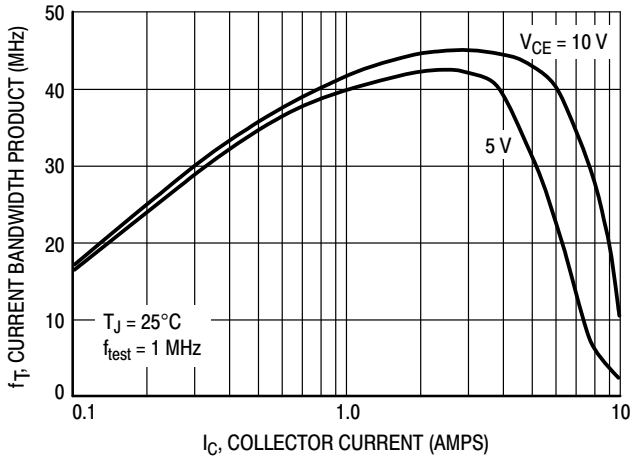


Figure 1. Typical Current Gain Bandwidth Product

NPN MJW3281A

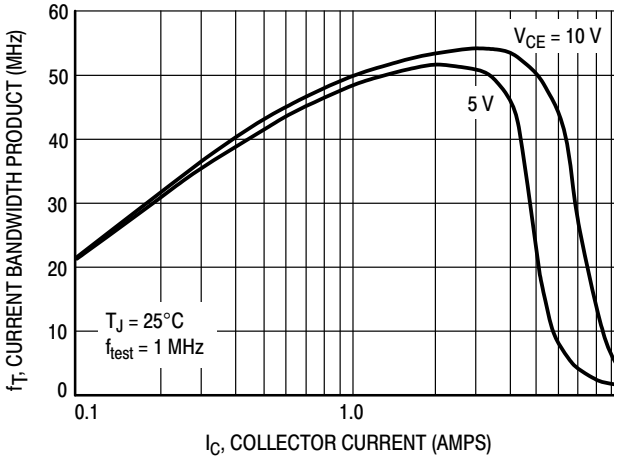


Figure 2. Typical Current Gain Bandwidth Product

PNP MJW1302A

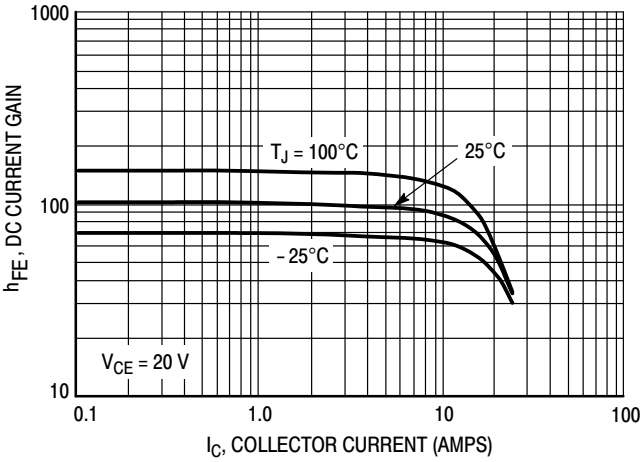


Figure 3. DC Current Gain, V_{CE} = 20 V

NPN MJW3281A

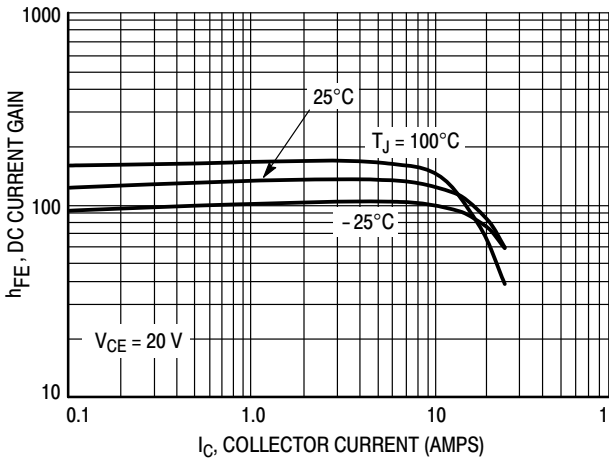


Figure 4. DC Current Gain, V_{CE} = 20 V

PNP MJW1302A

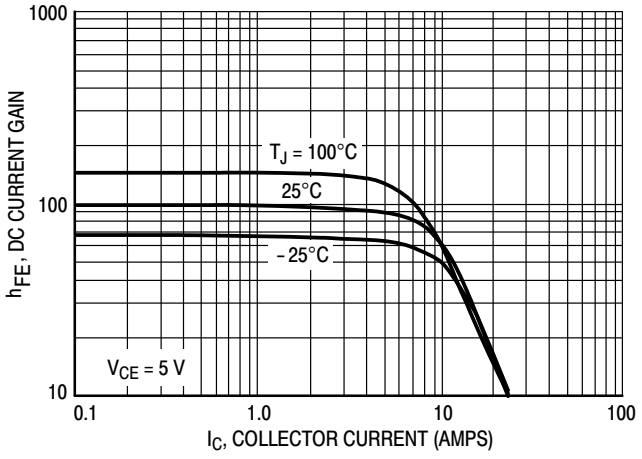


Figure 5. DC Current Gain, V_{CE} = 5 V

NPN MJW3281A

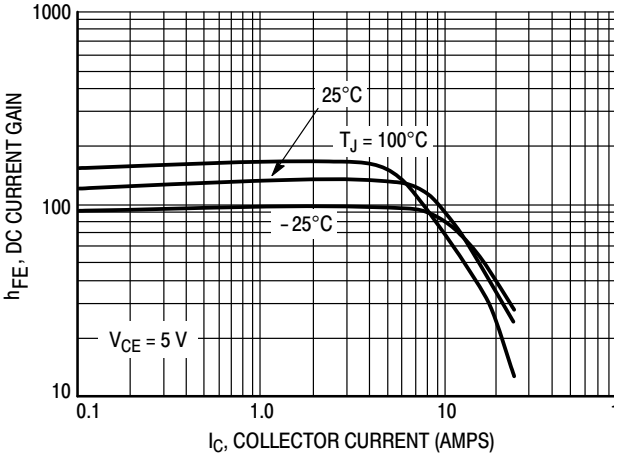


Figure 6. DC Current Gain, V_{CE} = 5 V

MJW3281A (NPN) MJW1302A (PNP)

TYPICAL CHARACTERISTICS

PNP MJW1302A

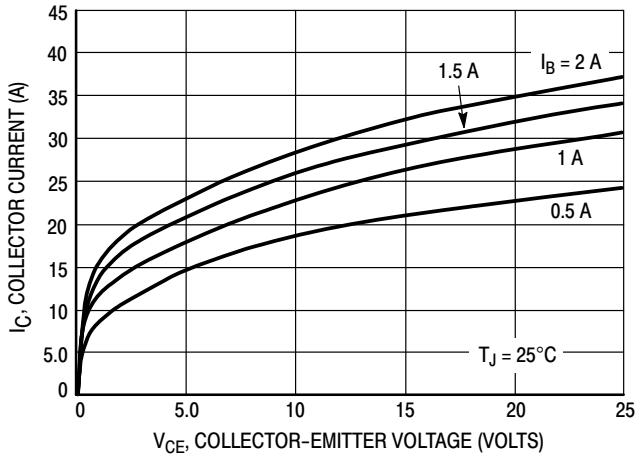


Figure 7. Typical Output Characteristics

NPN MJW3281A

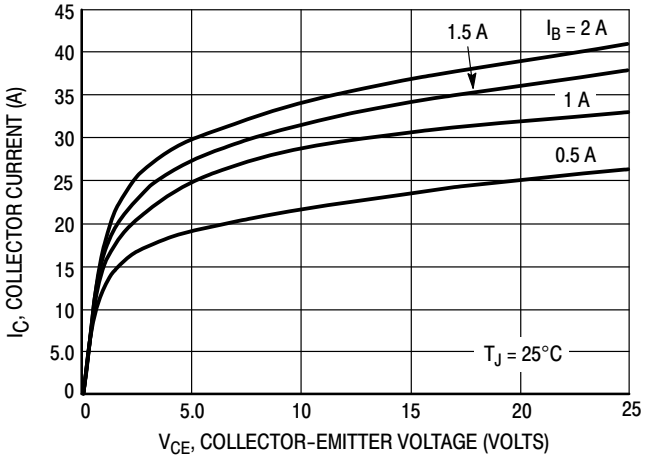


Figure 8. Typical Output Characteristics

PNP MJW1302A

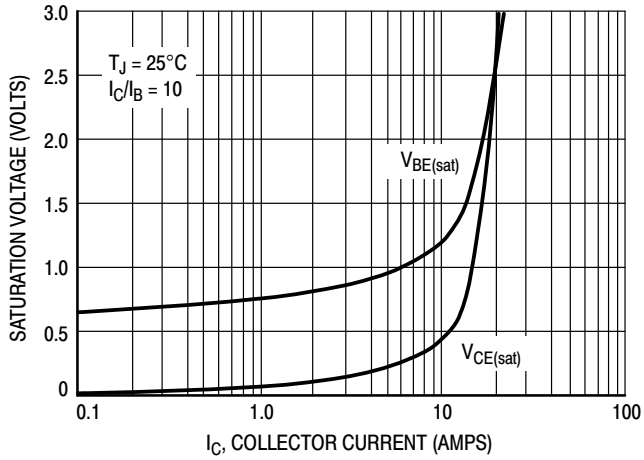


Figure 9. Typical Saturation Voltages

NPN MJW3281A

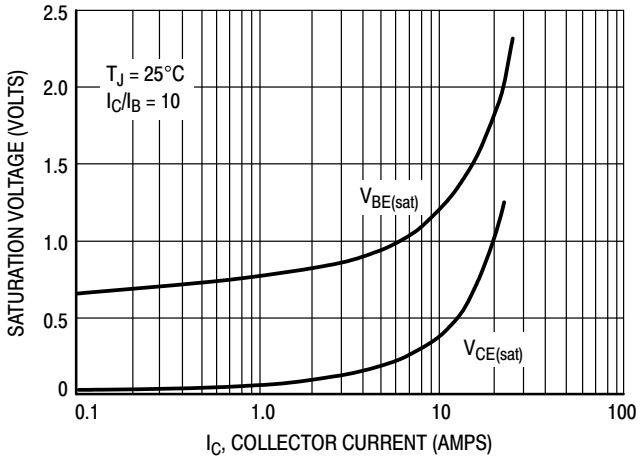


Figure 10. Typical Saturation Voltages

PNP MJW1302A

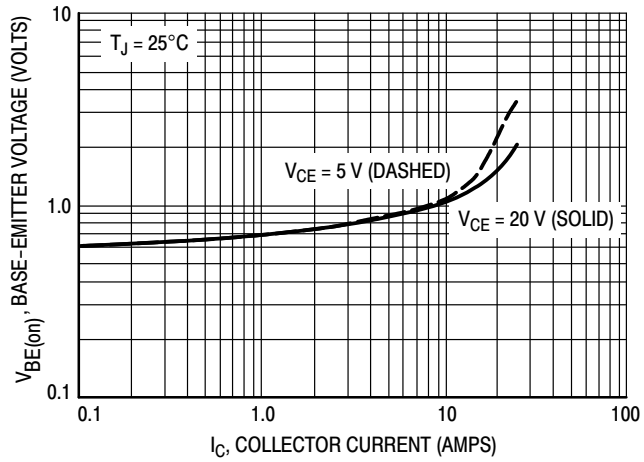


Figure 11. Typical Base−Emitter Voltage

NPN MJW3281A

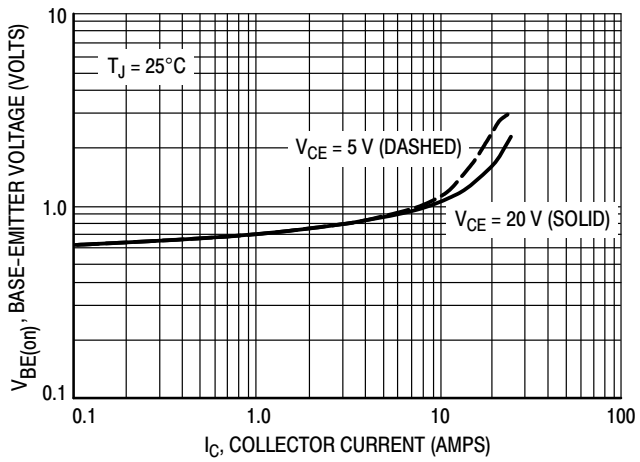


Figure 12. Typical Base−Emitter Voltage

MJW3281A (NPN) MJW1302A (PNP)

PNP MJW1302A

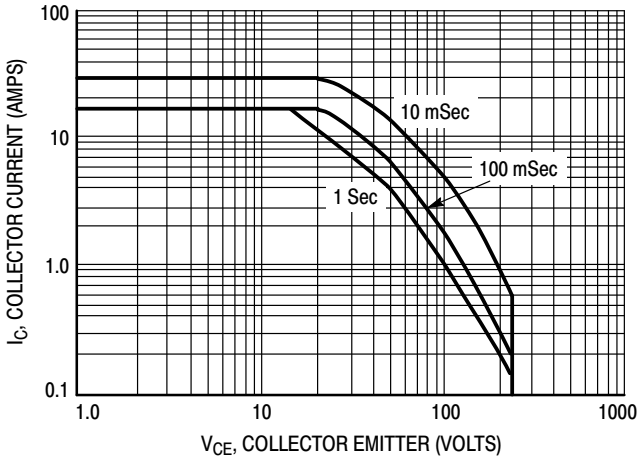


Figure 13. Active Region Safe Operating Area

NPN MJW3281A

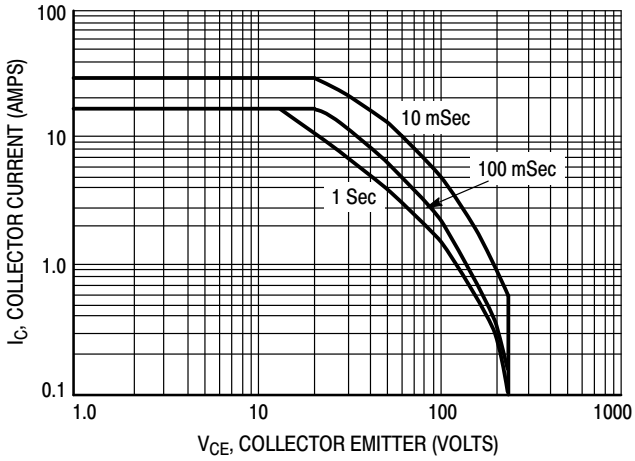


Figure 14. Active Region Safe Operating Area

There are two limitations on the power handling ability of a transistor; average junction temperature and secondary 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 than the curves indicate.

The data of Figures 13 and 14 is based on $T_{J(pk)} = 150°C$; T_C is variable depending on conditions. At high case temperatures, thermal limitations will reduce the power than can be handled to values less than the limitations imposed by second breakdown.

TYPICAL CHARACTERISTICS

PNP MJW1302A

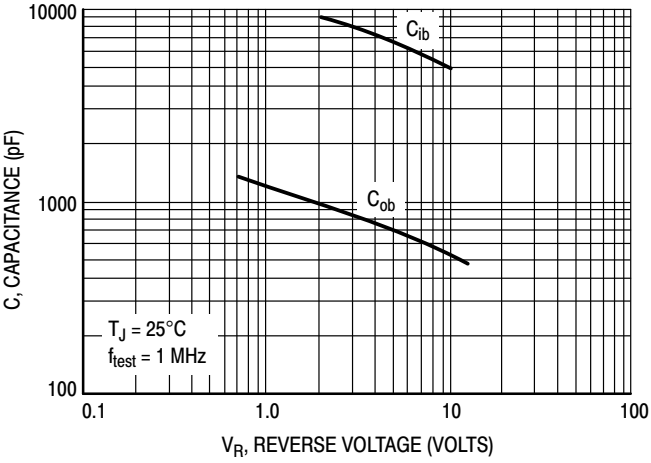


Figure 15. MJW1302A Typical Capacitance

NPN MJW3281A

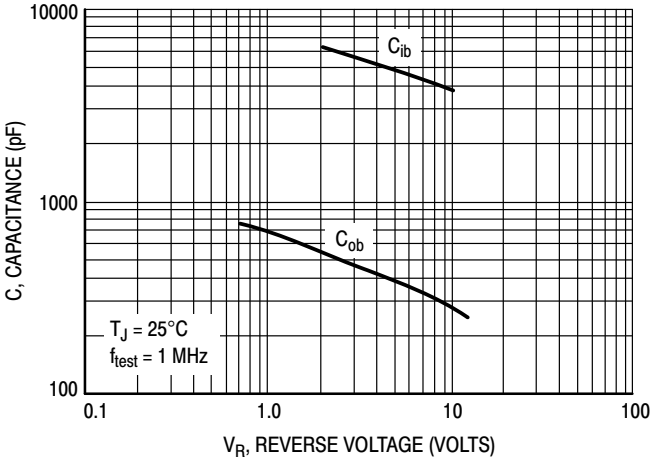
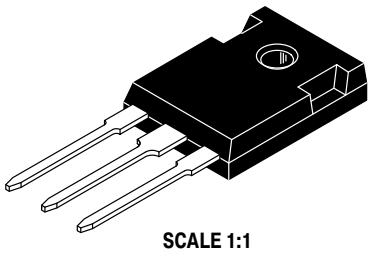


Figure 16. MJW3281A Typical Capacitance

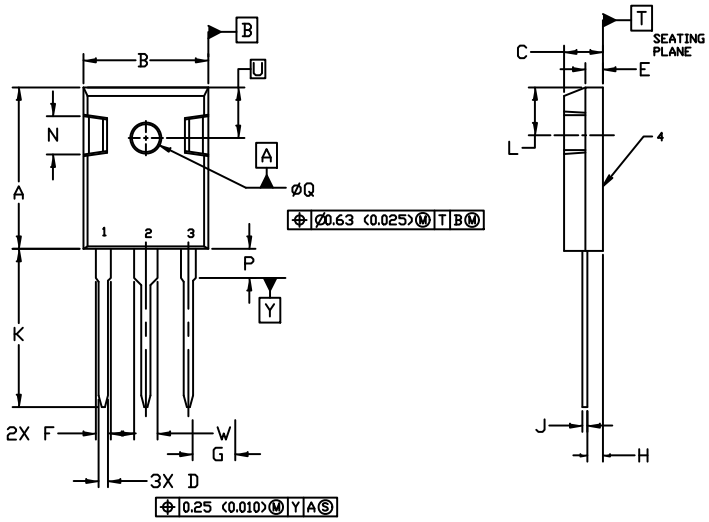
MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS



SCALE 1:1

TO−247
CASE 340L
ISSUE G

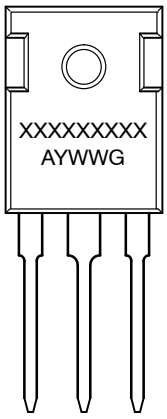
DATE 06 OCT 2021



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER

	MILLIMETERS		INCHES	
DIM	MIN.	MAX.	MIN.	MAX.
A	20.32	21.08	0.800	0.830
B	15.75	16.26	0.620	0.640
C	4.70	5.30	0.185	0.209
D	1.00	1.40	0.040	0.055
E	1.90	2.60	0.075	0.102
F	1.65	2.13	0.065	0.084
G	5.45 BSC		0.215 BSC	
H	1.50	2.49	0.059	0.098
J	0.40	0.80	0.016	0.031
K	19.81	20.83	0.780	0.820
L	5.40	6.20	0.212	0.244
N	4.32	5.49	0.170	0.216
P	----	4.50	----	0.177
Q	3.55	3.65	0.140	0.144
U	6.15 BSC		0.242 BSC	
W	2.87	3.12	0.113	0.123

GENERIC MARKING DIAGRAM*



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

STYLE 2:
PIN 1. ANODE
2. CATHODE (S)
3. ANODE 2
4. CATHODES (S)

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

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

STYLE 5:
PIN 1. CATHODE
2. ANODE
3. GATE
4. ANODE

STYLE 6:
PIN 1. MAIN TERMINAL 1
2. MAIN TERMINAL 2
3. GATE
4. MAIN TERMINAL 2

XXXXX = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
G = Pb−Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.

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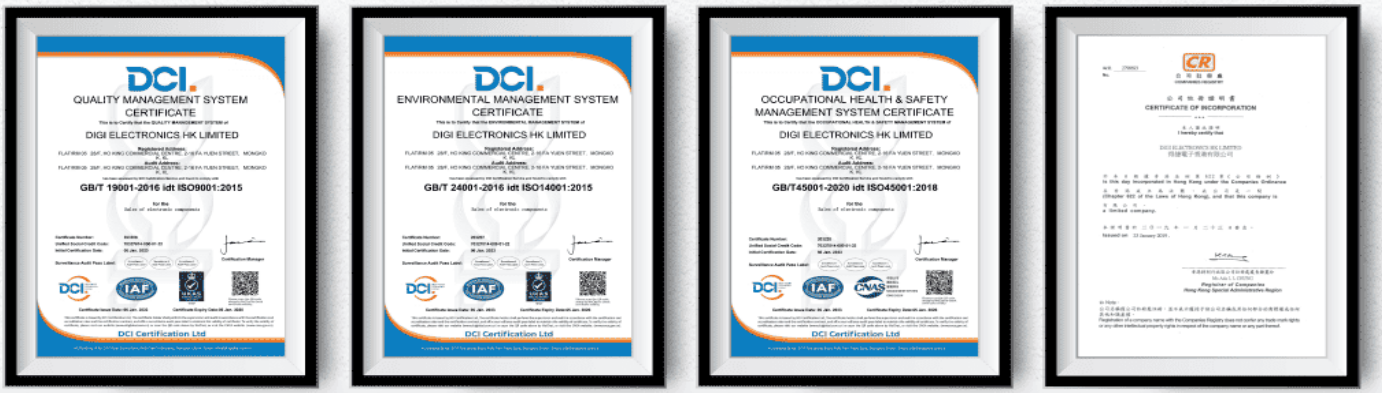

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