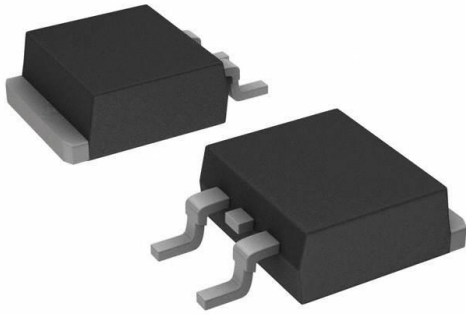


MJB44H11 Datasheet

www.digi-electronics.com



DiGi Electronics Part Number MJB44H11-DG

Manufacturer [onsemi](#)

Manufacturer Product Number MJB44H11

Description TRANS NPN 80V 10A D2PAK

Detailed Description Bipolar (BJT) Transistor NPN 80 V 10 A 50MHz 2 W Surface Mount D2PAK

<https://www.DiGi-Electronics.com>



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.

Purchase and inquiry

Manufacturer Product Number:

MJB44H11

Series:

-

Transistor Type:

NPN

Voltage - Collector Emitter Breakdown (Max):

80 V

Current - Collector Cutoff (Max):

10 μ A

Power - Max:

2 W

Operating Temperature:

-55°C ~ 150°C (TJ)

Package / Case:

TO-263-3, D2PAK (2 Leads + Tab), TO-263AB

Base Product Number:

MJB44

Manufacturer:

onsemi

Product Status:

Obsolete

Current - Collector (Ic) (Max):

10 A

Vce Saturation (Max) @ Ib, Ic:

1V @ 400mA, 8A

DC Current Gain (hFE) (Min) @ Ic, Vce:

40 @ 4A, 1V

Frequency - Transition:

50MHz

Mounting Type:

Surface Mount

Supplier Device Package:

D2PAK

Environmental & Export classification

RoHS Status:

RoHS non-compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.29.0075

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

MJB44H11 (NPN), NJVMJB44H11 (NPN), MJB45H11 (PNP), NJVMJB45H11 (PNP)



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Complementary Power Transistors

D²PAK for Surface Mount

Complementary power transistors are for general purpose power amplification and switching such as output or driver stages in applications such as switching regulators, converters and power amplifiers.

Features

- Low Collector–Emitter Saturation Voltage – $V_{CE(sat)} = 1.0\text{ V (Max) @ } 8.0\text{ A}$
- Fast Switching Speeds
- Complementary Pairs Simplifies Designs
- Epoxy Meets UL 94 V–0 @ 0.125 in
- ESD Ratings: Human Body Model, 3B > 8000 V
Machine Model, C > 400 V
- NJV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC–Q101 Qualified and PPAP Capable
- Pb–Free Packages are Available

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	80	Vdc
Emitter–Base Voltage	V_{EB}	5	Vdc
Collector Current – Continuous – Peak	I_C	10 20	Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	50 0.4	W W/ $^\circ\text{C}$
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	2.0 0.016	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–55 to 150	$^\circ\text{C}$

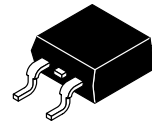
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction–to–Case	$R_{\theta JC}$	2.5	$^\circ\text{C/W}$
Thermal Resistance, Junction–to–Ambient	$R_{\theta JA}$	75	$^\circ\text{C/W}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

SILICON POWER TRANSISTORS 10 AMPERES, 80 VOLTS, 50 WATTS

MARKING DIAGRAM



D²PAK
CASE 418B
STYLE 1



x = 4 or 5
A = Assembly Location
Y = Year
WW = Work Week
G = Pb–Free Package

ORDERING INFORMATION

Device	Package	Shipping [†]
MJB44H11G	D ² PAK (Pb–Free)	50 Units/Rail
MJB44H11T4G	D ² PAK (Pb–Free)	800/Tape & Reel
NJVMJB44H11T4G	D ² PAK (Pb–Free)	800/Tape & Reel
MJB45H11G	D ² PAK (Pb–Free)	50 Units/Rail
MJB45H11T4G	D ² PAK (Pb–Free)	800/Tape & Reel
NJVMJB45H11T4G	D ² PAK (Pb–Free)	800/Tape & Reel

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

MJB44H11 (NPN), NJVMJB44H11 (NPN), MJB45H11 (PNP), NJVMJB45H11 (PNP)

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Sustaining Voltage ($I_C = 30\text{ mA}$, $I_B = 0$)	$V_{CE(sus)}$	80	-	-	Vdc
Collector Cutoff Current ($V_{CE} = \text{Rated } V_{CEO}$, $V_{BE} = 0$)	I_{CES}	-	-	10	μA
Emitter Cutoff Current ($V_{EB} = 5\text{ Vdc}$)	I_{EBO}	-	-	50	μA

ON CHARACTERISTICS

Collector-Emitter Saturation Voltage ($I_C = 8\text{ Adc}$, $I_B = 0.4\text{ Adc}$)	$V_{CE(sat)}$	-	-	1.0	Vdc
Base-Emitter Saturation Voltage ($I_C = 8\text{ Adc}$, $I_B = 0.8\text{ Adc}$)	$V_{BE(sat)}$	-	-	1.5	Vdc
DC Current Gain ($V_{CE} = 1\text{ Vdc}$, $I_C = 2\text{ Adc}$)	h_{FE}	60	-	-	-
DC Current Gain ($V_{CE} = 1\text{ Vdc}$, $I_C = 4\text{ Adc}$)		40	-	-	-

DYNAMIC CHARACTERISTICS

Collector Capacitance ($V_{CB} = 10\text{ Vdc}$, $f_{test} = 1\text{ MHz}$)	C_{cb}	MJB44H11, NJVMJB44H11	-	130	-	pF
		MJB45H11, NJVMJB45H11	-	230	-	
Gain Bandwidth Product ($I_C = 0.5\text{ Adc}$, $V_{CE} = 10\text{ Vdc}$, $f = 20\text{ MHz}$)	f_T	MJB44H11, NJVMJB44H11	-	50	-	MHz
		MJB45H11, NJVMJB45H11	-	40	-	

SWITCHING TIMES

Delay and Rise Times ($I_C = 5\text{ Adc}$, $I_{B1} = 0.5\text{ Adc}$)	$t_d + t_r$	MJB44H11, NJVMJB44H11	-	300	-	ns
		MJB45H11, NJVMJB45H11	-	135	-	
Storage Time ($I_C = 5\text{ Adc}$, $I_{B1} = I_{B2} = 0.5\text{ Adc}$)	t_s	MJB44H11, NJVMJB44H11	-	500	-	ns
		MJB45H11, NJVMJB45H11	-	500	-	
Fall Time ($I_C = 5\text{ Adc}$, $I_{B1} = I_{B2} = 0.5\text{ Adc}$)	t_f	MJB44H11, NJVMJB44H11	-	140	-	ns
		MJB45H11, NJVMJB45H11	-	100	-	

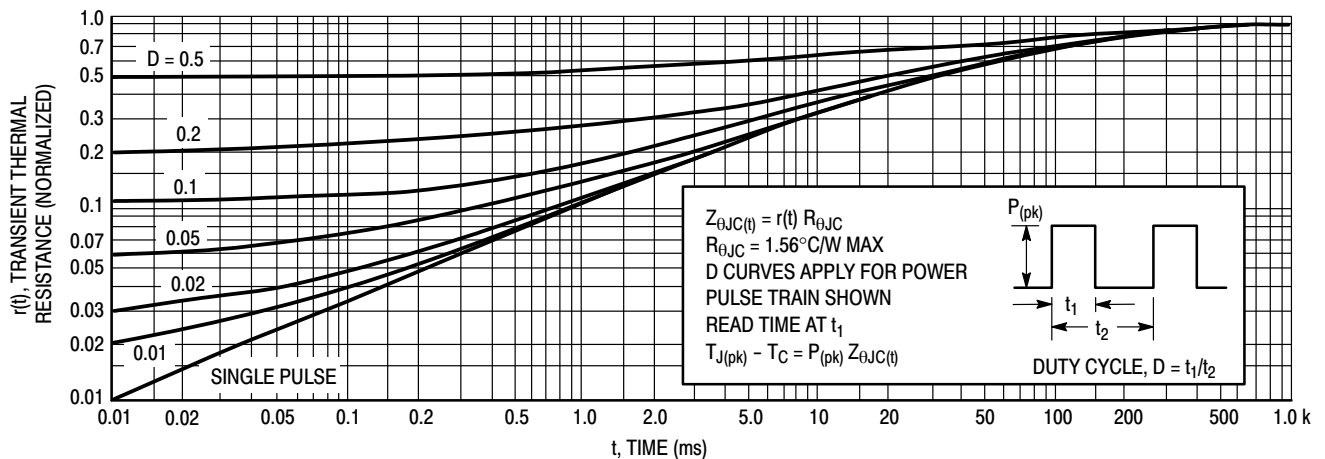


Figure 1. Thermal Response

MJB44H11 (NPN), NJVMJB44H11 (NPN), MJB45H11 (PNP), NJVMJB45H11 (PNP)

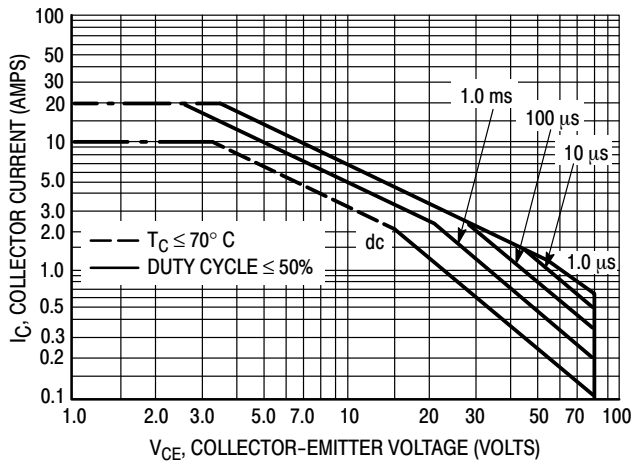


Figure 2. Maximum Rated Forward Bias Safe Operating Area

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 than the curves indicate.

The data of Figure 2 is based on $T_{J(pk)} = 150^\circ\text{C}$; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150^\circ\text{C}$. $T_{J(pk)}$ may be calculated from the data in Figure 1. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

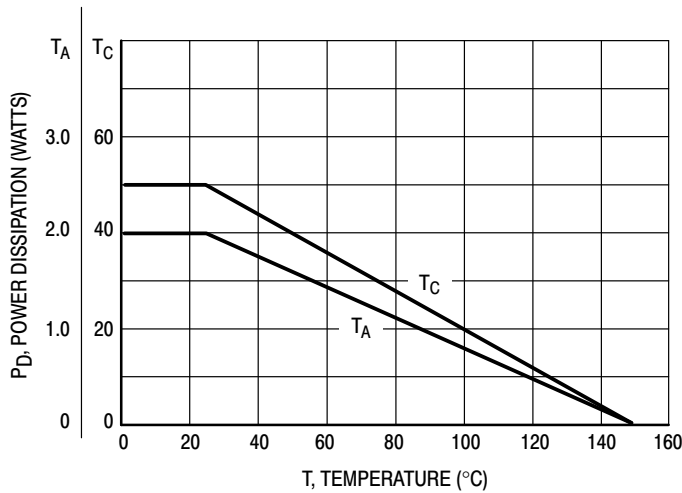


Figure 3. Power Derating

MJB44H11 (NPN), NJVMJB44H11 (NPN), MJB45H11 (PNP), NJVMJB45H11 (PNP)

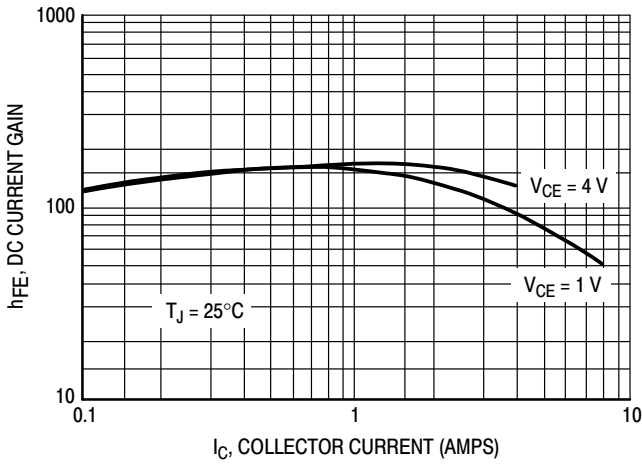


Figure 4. MJB44H11 DC Current Gain

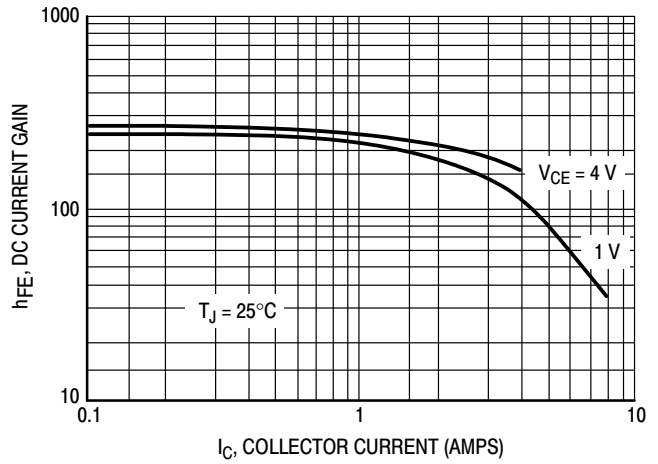


Figure 5. MJB45H11 DC Current Gain

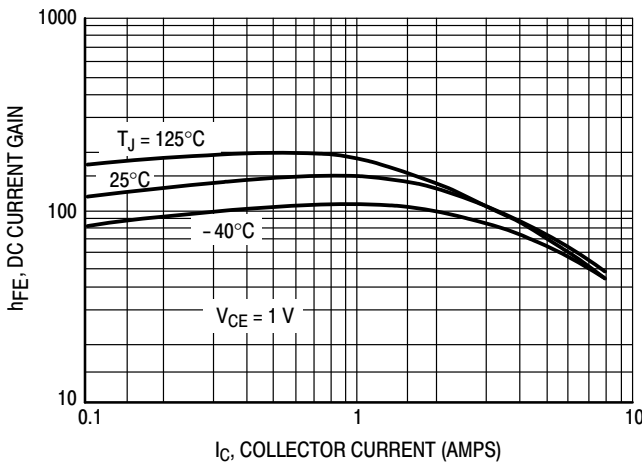


Figure 6. MJB44H11 Current Gain versus Temperature

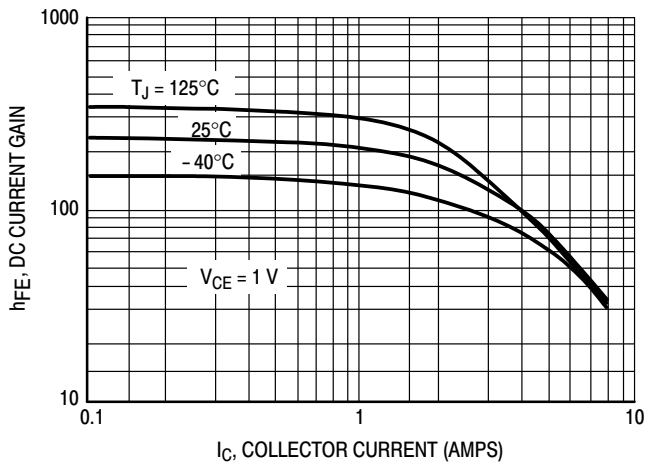


Figure 7. MJB45H11 Current Gain versus Temperature

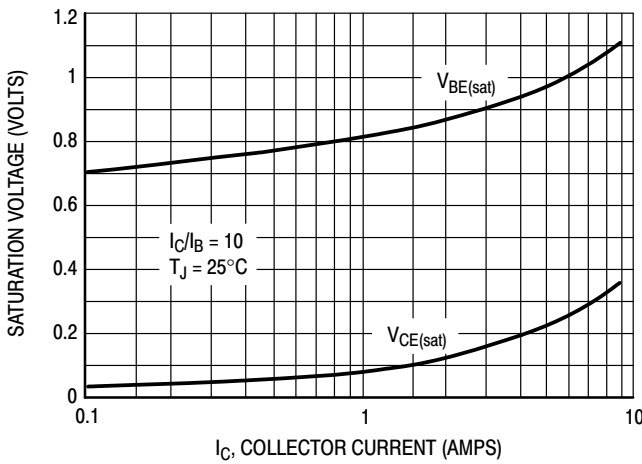


Figure 8. MJB44H11 On-Voltages

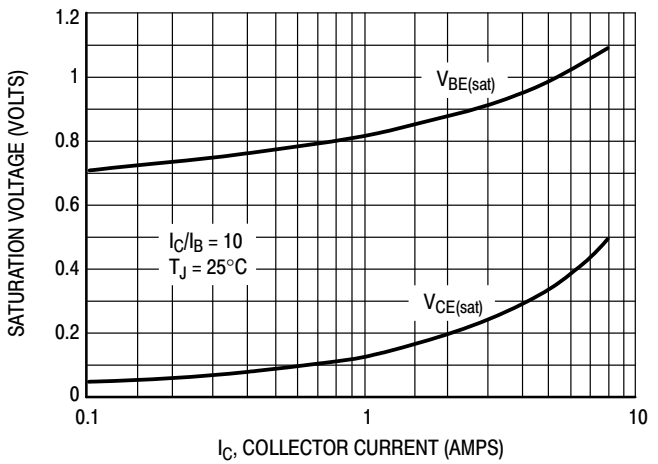


Figure 9. MJB45H11 On-Voltages



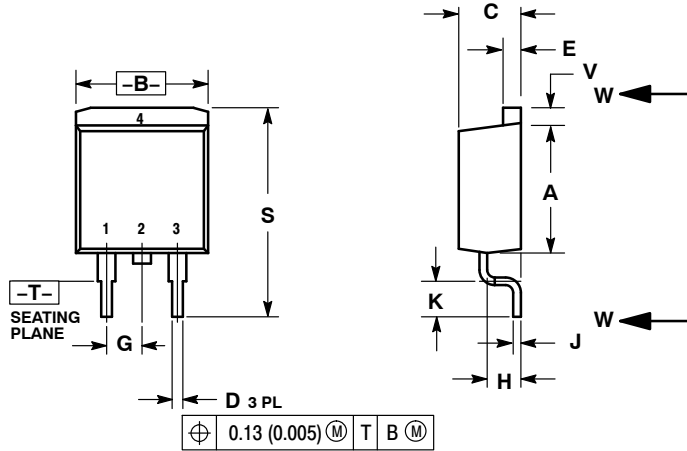
**MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS**



D²PAK 3
CASE 418B-04
ISSUE L

DATE 17 FEB 2015

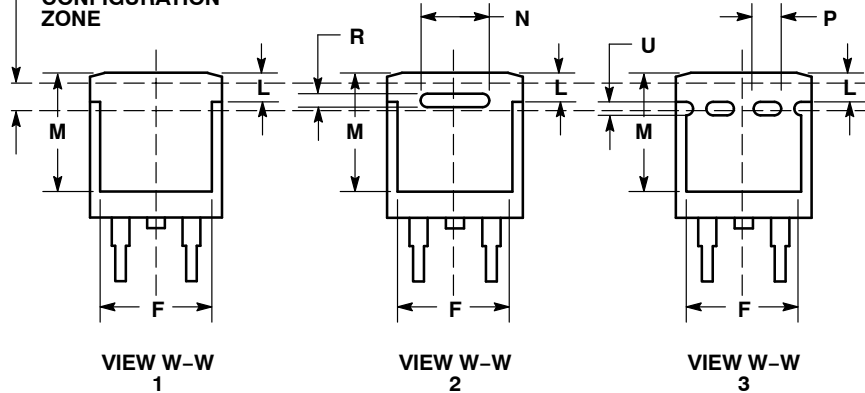
SCALE 1:1



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. 418B-01 THRU 418B-03 OBSOLETE, NEW STANDARD 418B-04.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.340	0.380	8.64	9.65
B	0.380	0.405	9.65	10.29
C	0.160	0.190	4.06	4.83
D	0.020	0.035	0.51	0.89
E	0.045	0.055	1.14	1.40
F	0.310	0.350	7.87	8.89
G	0.100 BSC		2.54 BSC	
H	0.080	0.110	2.03	2.79
J	0.018	0.025	0.46	0.64
K	0.090	0.110	2.29	2.79
L	0.052	0.072	1.32	1.83
M	0.280	0.320	7.11	8.13
N	0.197 REF		5.00 REF	
P	0.079 REF		2.00 REF	
R	0.039 REF		0.99 REF	
S	0.575	0.625	14.60	15.88
V	0.045	0.055	1.14	1.40

**VARIABLE
CONFIGURATION
ZONE**



- | | | | | | |
|--|---|---|--|---|--|
| STYLE 1:
PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR | STYLE 2:
PIN 1. GATE
2. DRAIN
3. SOURCE
4. DRAIN | STYLE 3:
PIN 1. ANODE
2. CATHODE
3. ANODE
4. CATHODE | STYLE 4:
PIN 1. GATE
2. COLLECTOR
3. EMITTER
4. COLLECTOR | STYLE 5:
PIN 1. CATHODE
2. ANODE
3. CATHODE
4. ANODE | STYLE 6:
PIN 1. NO CONNECT
2. CATHODE
3. ANODE
4. CATHODE |
|--|---|---|--|---|--|

MARKING INFORMATION AND FOOTPRINT ON PAGE 2

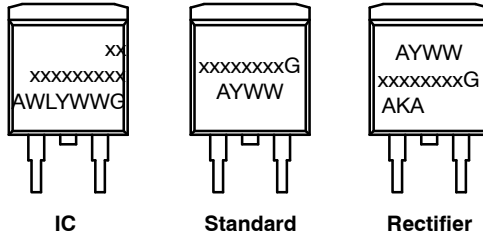
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D²PAK 3
CASE 418B-04
ISSUE L

DATE 17 FEB 2015

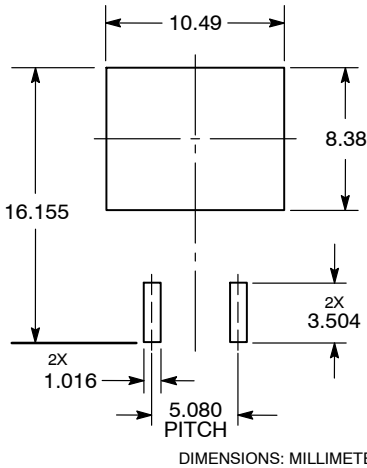
GENERIC MARKING DIAGRAM*



- xx = Specific Device Code
- A = Assembly Location
- WL = Wafer Lot
- Y = Year
- WW = Work Week
- G = Pb-Free Package
- AKA = Polarity Indicator

*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.

SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

*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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