

# High Voltage Goldmax, 300 Series, Conformally Coated, C0G Dielectric, 500 – 3,000 VDC (Commercial Grade)



## Overview

KEMET's 300 Series High Voltage Goldmax conformally coated radial led ceramic capacitors in C0G dielectric exhibit exceptional performance at high frequencies has made them feature a 125°C maximum operating temperature. The a preferred choice of design engineers worldwide. In addition Electronics Industries Alliance (EIA) characterizes C0G to their use in power supplies, these capacitors are widely dielectric as a Class I "stable" material. Components of this used in industries related to telecommunications, medical, Military, Space, Semiconductor and Test/Equipment. for resonant circuit applications or those where Q and stability of capacitance characteristics are required. C0G exhibits no change in capacitance with respect to time and voltage and boasts a negligible change in capacitance with reference to ambient temperature. Capacitance change is

These devices exhibit low ESR at high frequencies and



## Ordering Information

C	320			C	332	J	C	G	5	T	A	7301
Ceramic	Style/Size			7 T I G M	Capacitance Code (pF)	Capacitance Tolerance	Rated Voltage (VDC)	Dielectric	Design	Lead Finish	Failure Rate	Packaging (C-Spec)
	315	324	335	C = Standard	First two digits represent W M K R M	±0.1 pF	C = 500	G = C0G	5 = Multilayer	T = 100% Matte Sn	0% N/A	See "Packaging C-Spec Ordering Options Table" below
	316	325	336		W M K R M	±0.25 pF	B = 630			H = SnPb (60/40)		
	317	326	340		K Y V I W	±5%	D = 1,000					
	318	327	346		H M K M X	±10%	F = 1,500					
	320	328	350		number of zeros	±5%	G = 2,000					
	321	330	356			±5%	Z = 2,500					
	322	331				±10%	H = 3,000					
	323	333										

<sup>1</sup> Additional capacitance tolerance offerings may be available. Contact KEMET for details.

<sup>2</sup> Lead materials:

Standard: 100% matte tin (Sn) with nickel (Ni) underplate and steel core ("T" designation).

% P X I V R E X M Z R P E H F R M [W L X L T T I V V S P C B N p q H W M K R E X M S R

% P X I V R E X M Z R P E H F R M [W L X L G S T T G S V E Z E M [P M E F H W M K R E X M S R 7 T I G S R X E G X S V

' 7 T H & E M P W

- Radial leaded form factor
- Conformally coated
- 0.100", 0.200", 0.250", and 0.400" lead spacing
- Lead (Pb)-free, RoHS and REACH compliant
- DC voltage ratings of 500 V, 630 V, 1 KV, 1.5 KV, 2 KV, 2.5 KV, and 3 KV
- Available capacitance tolerances of ±0.1 pF, ±0.25 pF, ±0.5 pF, ±1%, ±2%, ±5%, and ±10%
- High temperature solder lead attach
- Extremely low ESR and ESL
- High thermal stability
- High ripple current capability
- No capacitance change with respect to applied rated DC voltage
- Negligible capacitance change with respect to temperature
- No capacitance decay with time
- Non-polar device, minimizing installation concerns
- Excellent solderability (Sn60/Pb40)

## Applications

equipment, industrial and medical equipment/control, LAN/WAN interface, analog and digital modems, and automotive.

## Application Notes

These devices are not recommended for use in overmold applications and/or processes.

## Packaging C-Spec Ordering Options Table

Packaging Type	Packaging/Grade Ordering Code (C-Spec)
Bulk Bag	Not required (Blank)
12" Tape & Reel (16.0±0.5 mm lead length)	7301
12" Tape & Reel (18.0 mm minimum lead length)	7303
Ammo Pack (16.0±0.5 mm lead length)	7305
Ammo Pack (18.0 mm minimum lead length)	7317

Information".

## Dimensions – Inches (Millimeters)

Shoulder Bend (Short)

Shoulder Bend (Tall)

Inside Kink

Straight

Outside Kink

Snap-In Type 2

Snap-In Type 1

\* May be supplied in a "Shoulder Bend" or "Straight" Lead  
G S R □ K Y ~~W E X I V Q~~ ~~R K I W J G R M S R~~  
S ~~J L M H G Y Q S R X I V Q~~ ~~R K Y ~~W E X I V Q~~~~ F M P M X ]  
capacitance value.

'SQQIVGMEP +VEHI TVSHYGXW EVI WYFNIGX XS MRXIVREP UYEPM GEX referenced in Table 2, Performance & Reliability.

### Environmental Compliance

01EH 4F JVII 6)%, ERH 6S,7 GSQTPMERX [MXLSYX I\IQTXMSRW [LIR S 4VSHYGX SVHIVIH [MXL XMR PIEH 7R 4F [MVI PIEH RRMWL HS RSX

Series	Termination Finish (Wire Lead)	RoHS Compliant	RoHS Exemption Code	REACH Compliant	Halogen Free
300 (C3XX)	100% Matte Sn	Yes	n/a	Yes	Yes
	Sn60/Pb40	No	n/a	Yes	Yes

1 6) % 'G S Q T P M E R T V S H Y G X W E V I W Y F N I G X X S M R X I V R E P U Y E P M G E X

### Electrical Parameters/Characteristics

Item	Parameters/Characteristics
Operating Temperature Range	— q' X S q'
Capacitance Change with Reference to q' ERH : (' % T T P M I H 8	+30 ppm/°C
Aging Rate (Maximum % Cap Loss/Decade Hour)	0.0%
Dielectric Withstanding Voltage	150% of rated voltage for voltage rating of < 1,000 V S J V E X I H Z S P X E K I J S V Z S P X E K I V E X M R K (5±1 seconds and charge/discharge not exceeding 50 mA)
Dissipation Factor (DF) Maximum Limit at 25	0.1%
Insulation Resistance (IR) Limit at 25°C	Q I K S L Q Q M G V S J E V E H W S V + 1 (500 VDC applied for 120±5 seconds at 25°C)

8 S S F X E M R Q H M X M ' H V Z E P M I X I G E T E G M E R E R C T E S + 1 M Q T M X I Q X S [ I S J X I X S M Q M X W  
' E T E G M E R E R H Q W M E T E X S V I F E W Y R I H H V S P P S Q V R H M X M S R W  
1, ^r Q ^ERH : r : M G E T E G M X E R G I  
Q ^r , ^ERH : r : M G E T E G M X E R G I  
2 S I ; L I R I E W Y C E M T E K M M R T G S V X E R X Y L V W X S P X E Z I M L I G S R W X E I R X E R H K M P I R X L E Z E J E X O V S [ R  
as Automatic Level Control (ALC). The ALC feature should be switched to "ON."

### Post Environmental Limits

High Temperature Life, Biased Humidity and Storage Life					
Style/Size	Rated DC Voltage	Capacitance Value	Dissipation Factor (Maximum %)	Capacitance Shift	Insulation Resistance
COG	All	All	0.5	0.3% or ±0.25 p	10% of Initial Limit



## Table 1A – C31X Style/Size, Capacitance Range Waterfall cont'd

## Table 1B – C32X Style/Size, Capacitance Range Waterfall

Table 1B – C32X Style/Size, Capacitance Range Waterfall cont'd

C320, C322, C323, C326, C328 Style/Size (0.100" and 0.200" Lead Spacing)						
Rated Voltage (VDC)	500	630	1000	1500	2000	
Voltage Code	C	B	D	F	G	
Capacitance	Capacitance Tolerance	Capacitance Code (Available Capacitance)				
11pF	F = ±1% G = ±2% J = ±5% K = ±10%	110	110	110	110	110
12pF		120	120	120	120	120
13pF		130	130	130	130	130
15pF		150	150	150	150	150
16pF		160	160	160	160	160
18pF		180	180	180	180	180
20pF		200	200	200	200	200
22pF		220	220	220	220	220
24pF		240	240	240	240	240
27pF		270	270	270	270	270
30pF		300	300	300	300	300
33pF		330	330	330	330	330
36pF		360	360	360	360	360
39pF		390	390	390	390	390
43pF		430	430	430	430	430
47pF		470	470	470	470	470
51pF		510	510	510	510	510
56pF		560	560	560	560	560
62pF		620	620	620	620	620
68pF		680	680	680	680	680
75pF		750	750	750	750	750
82pF		820	820	820	820	820
91pF		910	910	910	910	910
100pF		101	101	101	101	101
110pF		111	111	111	111	111
120pF		121	121	121	121	121
130pF		131	131	131	131	131
150pF		151	151	151	151	151
160pF		161	161	161	161	161
180pF		181	181	181	181	181
200pF		201	201	201	201	201
220pF		221	221	221	221	221
240pF		241	241	241	241	241
270pF		271	271	271	271	271
300pF		301	301	301	301	301
330pF		331	331	331	331	331
360pF		361	361	361	361	361
390pF		391	391	391	391	391
430pF		431	431	431	431	431
470pF		471	471	471	471	471
510pF		511	511	511	511	511
560pF		561	561	561	561	561
620pF	621	621	621	621	621	
680pF	681	681	681	681	681	
750pF	751	751	751	751		
820pF	821	821	821	821		
910pF	911	911	911	911		
1000pF	102	102	102	102		
1100pF	112	112	112	112		
1200pF	122	122	122	122		
1300pF	132	132	132			
1500pF	152	152	152			
1600pF	162	162	162			
1800pF	182	182	182			
2000pF	202	202	202			
2200pF	222	222	222			
Rated Voltage (VDC)	500	630	1000	1500	2000	
Voltage Code	C	B	D	F	G	

8 L I W S H E V T I X S X I C R H S Q S S I X L J S P P S I R M X E X E W I R K X L I M S R G S Y R X I O T E V X S W 9 7 4 E X S

## Table 1B – C32X Style/Size, Capacitance Range Waterfall cont'd

## Table 1C – C32X Style/Size, Capacitance Range Waterfall





Table 1D – C33X Style/Size, Capacitance Range Waterfall

C330, C331, C333, C335, C336 Style/Size (0.200" and 0.250" Lead Spacing)								
Rated Voltage (VDC)	500	630	1000	1500	2000	2500	3000	
Voltage Code	C	B	D	F	G	Z	H	
Capacitance	Capacitance Tolerance	Capacitance Code (Available Capacitance)						
10pF		100*	100*	100*	100*	100*	100	100
11pF		110*	110*	110*	110*	110*	110	110
12pF		120*	120*	120*	120*	120*	120	120
13pF		130*	130*	130*	130*	130*	130	130
15pF		150*	150*	150*	150*	150*	150	150
16pF		160*	160*	160*	160*	160*	160	160
18pF		180*	180*	180*	180*	180*	180	180
20pF		200*	200*	200*	200*	200*	200	200
22pF		220*	220*	220*	220*	220*	220	220
24pF		240*	240*	240*	240*	240*	240	240
27pF		270*	270*	270*	270*	270*	270	270
30pF		300*	300*	300*	300*	300*	300	300
33pF		330*	330*	330*	330*	330*	330	330
36pF		360*	360*	360*	360*	360*	360	360
39pF		390*	390*	390*	390*	390*	390	390
43pF		430*	430*	430*	430*	430*	430	430
47pF		470*	470*	470*	470*	470*	470	470
51pF		510*	510*	510*	510*	510*	510	510
56pF		560*	560*	560*	560*	560*	560	560
62pF		620*	620*	620*	620*	620*	620	620
68pF		680*	680*	680*	680*	680*	680	680
75pF		750*	750*	750*	750*	750*	750	750
82pF		820*	820*	820*	820*	820*	820	820
91pF		910*	910*	910*	910*	910*	910	910
100pF		101*	101*	101*	101*	101*	101	101
110pF		111*	111*	111*	111*	111*	111	111
120pF		121*	121*	121*	121*	121*	121	121
130pF		131*	131*	131*	131*	131*	131	131
150pF		151*	151*	151*	151*	151*	151	151
160pF		161*	161*	161*	161*	161*	161	161
180pF		181*	181*	181*	181*	181*	181	181
200pF		201*	201*	201*	201*	201*	201	201
220pF		221*	221*	221*	221*	221*	221	221
240pF		241*	241*	241*	241*	241*	241	241
270pF		271*	271*	271*	271*	271*	271	271
300pF		301*	301*	301*	301*	301*	301	301
330pF		331*	331*	331*	331*	331*	331	331
360pF		361*	361*	361*	361*	361*	361	361
390pF		391*	391*	391*	391*	391*	391	391
430pF		431*	431*	431*	431*	431*	431	431
470pF		471*	471*	471*	471*	471*	471	471
510pF		511*	511*	511*	511*	511*	511	511
560pF		561*	561*	561*	561*	561*	561	561
620pF		621*	621*	621*	621*	621*	621	621
680pF		681*	681*	681*	681*	681*	681	681
750pF		751*	751*	751*	751*	751	751	
820pF		821*	821*	821*	821*	821	821	
910pF		911*	911*	911*	911*	911	911	
1000pF		102*	102*	102*	102*	102	102	
1100pF		112*	112*	112*	112*	112	112	
1200pF		122*	122*	122*	122*	122	122	
1300pF		132*	132*	132*	132	132	132	
1500pF		152*	152*	152*	152	152	152	
1600pF		162*	162*	162*	162	162	162	
1800pF		182*	182*	182*	182	182	182	
2000pF		202*	202*	202*	202	202		
Rated Voltage (VDC)	500	630	1000	1500	2000	2500	3000	
Voltage Code	C	B	D	F	G	Z	H	

F = ±1%  
G = ±2%  
J = ±5%  
K = ±10%

8 L I W S H E V I X W S X I G R H S Q S S I X L J S P P S I R M F X B X E W I R X W L I M S R C S Y R X I 9 7 4 E X S W 9 7 4 E X S

' E T E G M X S T R M H Z L S Y P H I V E S R H K Y W E X J P S R M A R H







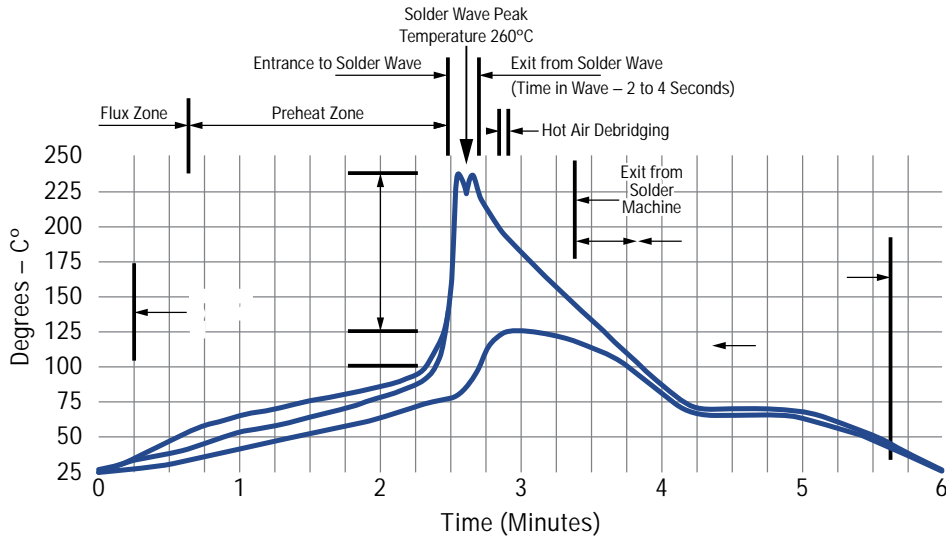


## Soldering Process

Recommended Soldering Methods:

- Solder Wave
- Hard Soldering (Manual)

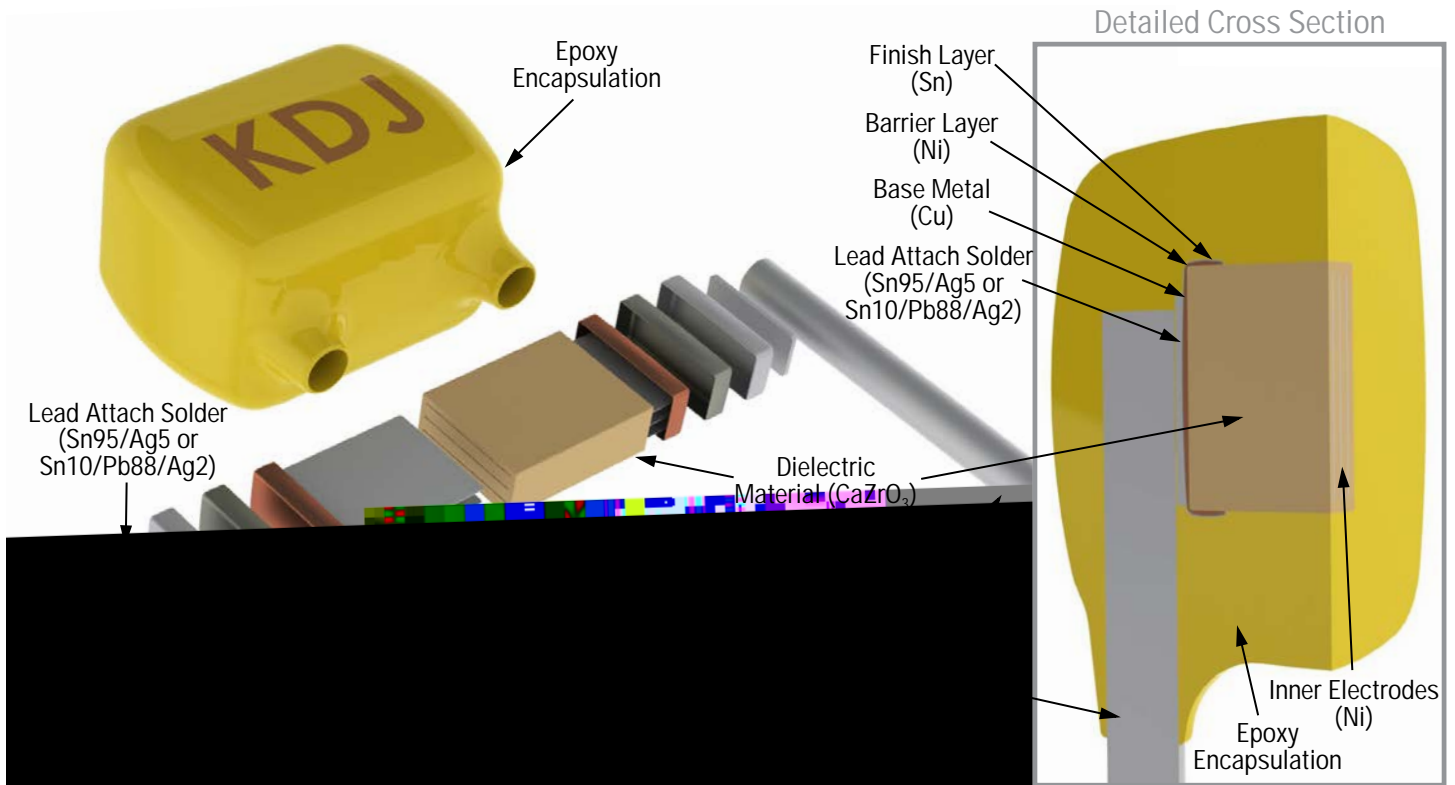
u3TKMQYQ ;EZI 7SPHIV 4VS πPI



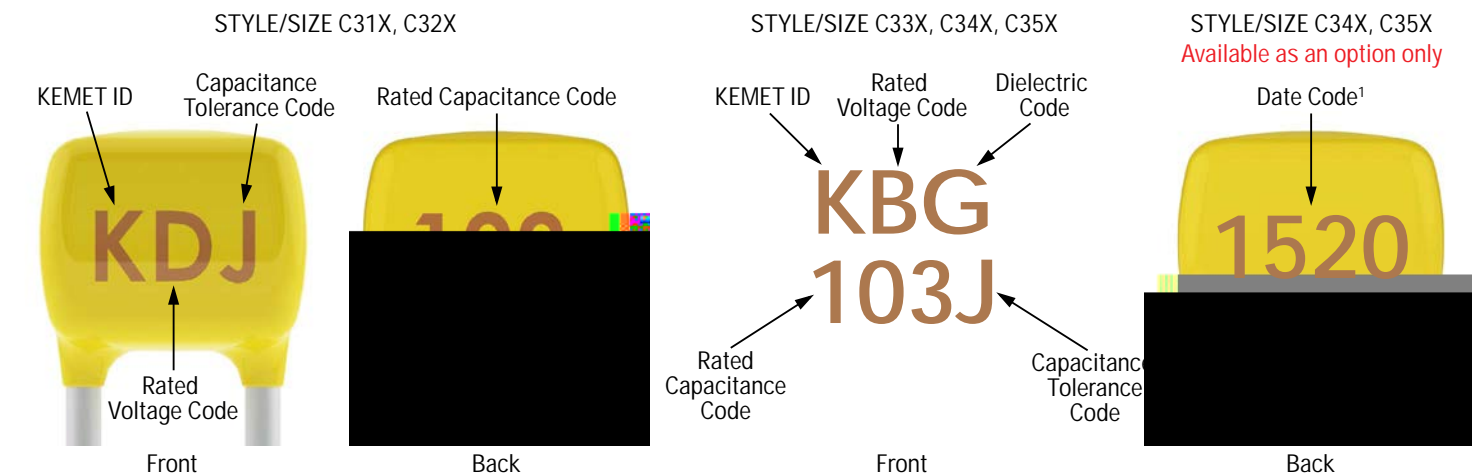




## Construction



## Marking



1 8 ST V S TV V P Y X W R G P S X L N I S R I M R L Q E V O M R R I S V Q E S Z I S R L H  
G Q T S R S R X I V G I R I K 7 4 ) ' Q Y V I X E H D S L I I R I S J X I S V H I V G I R I K

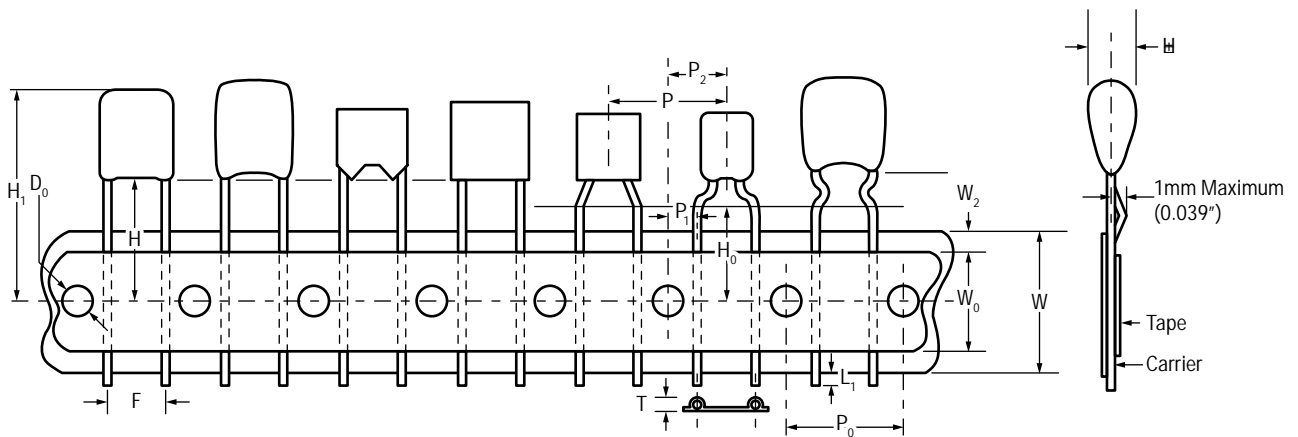
Date Code	
15	20
1 E R Y J E G X Y V M R R Y E E G X Y V M R K ; 15 = 2015	20 = Week 20 (of mfg. calendar year)

## Packaging Quantities

Style/ Size	Standard Bulk Quantity	Ammo Pack Quantity Maximum	Reel Quantity Maximum (12" Reel)
315	500/Bag	2500	2500
316			
317			
318			
320			
321		N/A	N/A
322		2500	2500
323			
324			
325			
326			
327			
328	250/Bag	1500	1500
330		N/A	N/A
331		1500	
333		1500	
335		1500	
336	100/Bag	1000	1000
340			
346	50/Bag	N/A	500
350			
356			

## Tape & Reel Packaging Information

KEMET offers standard reeling of Molded and Conformally Coated Radial Leaded Capacitors in accordance with EIA standard 468. Parts are taped to a tagboard carrier strip, and wound on a reel as shown in Figure 1. Kraft paper interleaving is inserted between the layers of capacitors on



## Ceramic Radial Tape and Reel Dimensions cont'd

Metric will govern

Variable Dimensions — Millimeters (Inches)							
F ±0.78 (0.030)	P <sub>1</sub> ±0.30 (0.012)	P ±0.3 (0.012)	P <sub>2</sub> ±1.3 (0.51)	H		H <sub>0</sub>	
				7 X V E M K L X 0 I E H ' S R ± K Y V E X M S R <sup>2</sup> * S V Q I H			
				Packaging C-Spec			
7301/7305		7303/7317		7301/7305		7303/7317	
2.54 (0.100)	5.08 (0.200)	12.7 (0.500)	6.35 (0.250)	16.0±0.5 (0.630±0.020)	18.0 (0.709) Minimum	16.0±0.5 (0.630±0.020)	18.0 (0.709) Minimum
4.32 (0.170)	3.89 (0.153)	12.7 (0.500)	6.35 (0.250)				
5.08 (0.200)	3.81 (0.150)	12.7 (0.500)	6.35 (0.250)				
5.59 (0.220)	3.25 (0.128)	12.7 (0.500)	6.35 (0.250)				
6.98 (0.275)	2.54 (0.100)	12.7 (0.500)	6.35 (0.250)				
7.62 (0.300)	2.24 (0.088)	12.7 (0.500)	6.35 (0.250)				
9.52 (0.375)	7.62 (0.300)	12.7 (0.500)	6.35 (0.250)				
10.16 (0.400)	7.34 (0.290)	25.4 (1.000)	N/A				
12.06 (0.475)	6.35 (0.250)	25.4 (1.000)	N/A				
14.60 (0.575)	5.08 (0.200)	25.4 (1.000)	N/A				
17.14 (0.675)	3.81 (0.15)	25.4 (1.000)	N/A				

<sup>1</sup> 11EWYVIH EX XLI IKVIWW JVSQ XLI GEVVMIV XETI SR XLI GSQTSRIRX WMHI

<sup>2</sup> \*SVQIH PIEH GSR± KYVEXMSR MRGPYHIW WLSYPHIV FIRH MRWMHI OMRO SYXW  
 GSR± KYVEXMSRW WII (MQIRWMSRW WIGXMSR SJ XLMW HSGYQIRX  
 8LI 4EGOEKMRK ' 7TIG MW E HMKMX GSHI [LMGL MHIRXM± IW XLI TEGOEKMRK X]T  
 MRGPYHIH MR XLI XL XLVSYKL XL GLEVEGXIV TSWMXMSRW SJ XLI SVHIVMRK GSHI

Symbol Reference Table	
D <sub>0</sub>	Sprocket Hole Diameter
P <sub>0</sub>	Sprocket Hole Pitch
P	Component Pitch
F	Lead Spacing
P <sub>1</sub>	Sprocket Hole Center to Lead Center
P <sub>2</sub>	Sprocket Hole Center To Component Center
H	Height to Seating Plane (Straight Leads Only)
H <sub>0</sub>	Height to Seating Plane (Formed Leads Only)
H <sub>1</sub>	Component Height Above Tape Center
±	Component Alignment
L <sub>1</sub>	Lead Protrusion
t	Composite Tape Thickness
W	Carrier Tape Width
W <sub>0</sub>	Hold-Down Tape Width
W <sub>2</sub>	Hold-Down Tape Location

\* S V E G S Q T P I X I P M W X S J S Y V K P S F E P W E P I W S J G I W T P I E W I Z M W M X

## Disclaimer

% P P T V S H Y G X W T I G M G E X M S R W W X E X I Q I R X W M R J S V Q E X M S R E R H H E X E G S P P I G X M Z I P ] X L I p  
checking and verifying the extent to which the Information contained in this publication is applicable to an order at the time the order is placed.

All Information given herein is believed to be accurate and reliable, but it is presented without guarantee, warranty, or responsibility of any kind, expressed or in

7 X E X I Q I R X W S J W Y M X E F M P M X ] J S V G I V X E M R E T T P M G E X M S R W E V I F E W I H S R / ) 1 ) 8 ) P I G X V S R M G W  
E T T P M G E X M S R W F Y X E V I R S X M R X I R H I H X S G S R W X M X Y X I i E R H / ) 1 ) 8 W T I G M G E P P ] H M W G P E M C

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