



CTS[®]

STANDARD PRODUCTS CATALOG 2007-2008

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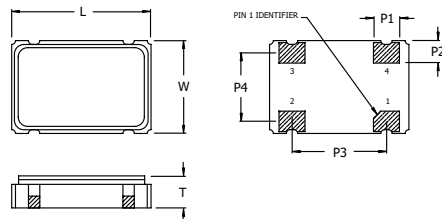
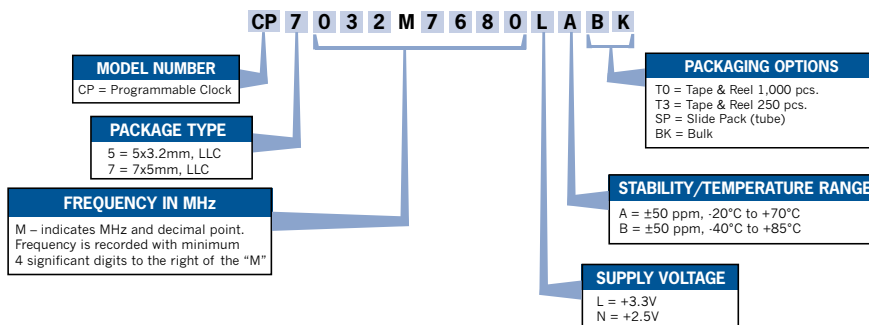
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CLOCK OSCILLATORS



Standard Models	nWave	CB3
Package	5 x 3.2mm, 5 x 7mm Surface Mount	5 x 7mm Surface Mount
Frequency Range	2.0 to 200 MHz (Programmed by Authorized Distributors)	1.5 to 133 MHz
Tolerance	±.005% (50 PPM)	±.005% (50 PPM)
Operating Temperature	Commercial -20°C to 70°C Industrial -40°C to 85°C	-20°C to 70°C
Duty Cycle	45% to 55%	45% to 55%
Supply Voltage (DC)	2.5 volts ±10% & 3.3 volts ±10%	Std. 5.0 volts ±10%, LV 3.3 volts ±10%
Tristate Option	Output Enable (stand by)	Tri-State
Output Logic	LVC MOS	CMOS/TTL
Standard Packaging	See Packaging Options 8mm Pitch	1000pc Tape & Reel 8mm Pitch
RoHS Compliant	Yes	Yes

EXAMPLE PART NUMBER: CP7032M7680LABK



DIMENSION TABLE

PACKAGE	L	W	T	P1	P2	P3	P4
CP5	5.0 ± 0.2	3.2 ± 0.2	1.2 Max	1.2	1.0	2.54	2.2
	0.197 ± 0.008	0.126 ± 0.008	0.047 Max	0.047	0.039	0.100	0.087
CP7	7.0 ± 0.2	5.0 ± 0.2	1.6 Max	1.4	1.2	5.08	3.7
	0.276 ± 0.008	0.197 ± 0.008	0.063 Max	0.055	0.047	0.200	0.146

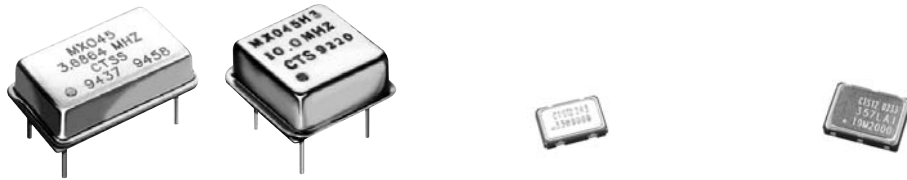
Key: mm
Inch

STANDARD PART NUMBERS - CB3 (frequencies in bold are most popular)

PART NUMBER*	FREQUENCY (MHz)
CB3-3C-1.5440-T	1.54400
CB3-3C-1.8432-T	1.84320
CB3-3C-3.6864-T	3.68640
CB3-3C-4.0000-T	4.00000
CB3-3C-6.1760-T	6.17600
CB3-3C-7.3728-T	7.37280
CB3-3C-8.0000-T	8.00000
CB3-3C-10.0000-T	10.00000
CB3-3C-12.0000-T	12.00000
CB3-3C-12.2880-T	12.88000
CB3-3C-12.3520-T	12.35200
CB3-3C-14.31818-T	14.31818
CB3-3C-15.3600-T	15.36000
CB3-3C-16.0000-T	16.00000
CB3-3C-16.3840-T	16.38400
CB3-3C-18.4320-T	18.43200
CB3-3C-19.4400-T	19.44000
CB3-3C-20.0000-T	20.00000
CB3-3C-20.4800-T	20.48000
CB3-3C-24.0000-T	24.00000
CB3-3C-24.7040-T	24.70400
CB3-3C-25.0000-T	25.00000
CB3-3C-29.4912-T	29.49120
CB3-3C-30.0000-T	30.00000
CB3-3C-32.0000-T	32.00000
CB3-3C-32.7680-T	32.76800
CB3-3C-33.3330-T	33.33300
CB3-3C-40.0000-T	40.00000
CB3-3C-44.7360-T	44.73600
CB3-3C-45.0000-T	45.00000
CB3-3C-49.1520-T	49.15200
CB3-3C-50.0000-T	50.00000
CB3-3C-51.8400-T	51.84000
CB3-3C-60.0000-T	60.00000
CB3-3C-64.0000-T	64.00000
CB3-3C-66.6666-T	66.66660
CB3-3C-72.0000-T	72.00000
CB3-3C-80.0000-T	80.00000

*For Low Voltage (3.3V) Part, Insert the letters "LV" after CB3 and before the frequency ie: CB3LV-3C-1.5440-T

CLOCK OSCILLATORS



Standard Models	MXO45 & MXO45HS (Half Size)	636	357 VCXO
Package	14 Pin DIP, 8 Pin DIP (HS)	3.2 x 5mm SMT	5 x 7mm SMT
Frequency Range	1.0 to 105 MHz	1.75 to 75 MHz	1.5 to 52 MHz
Tolerance	±.005% (50 PPM)	±.005% (50 PPM)	±.005% (50 PPM)
Operating Temperature	-20°C to 70°C	-20°C to 70°C	-40°C to 85°C
Duty Cycle	45% to 55%	45% to 55%	45% to 55%
Supply Voltage (DC)	5.0 volts +/-10%	3.3 volts	3.3 volts
Tristate Option	Optional	Tri-State	Tri-State
			APR>100 PPM
Output Logic	CMOS/TTL	CMOS/TTL	HCMOS
Standard Packaging	MXO45/MXO45T = 50pc Tray MXO45HS/MXO45HST = 50pc Tray	1000pc Tape & Reel 8mm Pitch	1000pc Tape & Reel 8mm Pitch
RoHS Compliant	Date Code 0540	Yes	Yes

STANDARD PART NUMBERS - MXO45 & MXO45HS (frequencies in **bold** are most popular)

PART NUMBER MXO45	PART NUMBER MXO45HS (Half Size)	FREQUENCY (MHz)
MXO45-3C-1.0000	MXO45HS-3C-1.0000	1.00000
MXO45-3C-1.8432	MXO45HS-3C-1.8432	1.84320
MXO45-3C-2.0000	MXO45HS-3C-2.0000	2.00000
MXO45-3C-2.4576	MXO45HS-3C-2.4576	2.45760
MXO45-3C-3.6864	MXO45HS-3C-3.6864	3.68640
MXO45-3C-4.0000	MXO45HS-3C-4.0000	4.00000
MXO45-3C-4.9152	MXO45HS-3C-4.9152	4.91520
MXO45-3C-5.0000	MXO45HS-3C-5.0000	5.00000
MXO45-3C-5.0688	MXO45HS-3C-5.0688	5.06880
MXO45-3C-6.0000	MXO45HS-3C-6.0000	6.00000
MXO45-3C-6.1440	MXO45HS-3C-6.1440	6.14400
MXO45-3C-7.3728	MXO45HS-3C-7.3728	7.37280
MXO45-3C-8.0000	MXO45HS-3C-8.0000	8.00000
MXO45-3C-10.0000	MXO45HS-3C-10.0000	10.00000
MXO45-3C-12.0000	MXO45HS-3C-12.0000	12.00000
MXO45-3C-14.31818	MXO45HS-3C-14.31818	14.31818
MXO45-3C-16.0000	MXO45HS-3C-16.0000	16.00000
MXO45-3C-18.4320	MXO45HS-3C-18.4320	18.43200
MXO45-3C-19.6608	MXO45HS-3C-19.6608	19.66080
MXO45-3C-20.0000	MXO45HS-3C-20.0000	20.00000
MXO45-3C-24.0000	MXO45HS-3C-24.0000	24.00000
MXO45-3C-25.0000	MXO45HS-3C-25.0000	25.00000
MXO45-3C-25.1750	MXO45HS-3C-25.1750	25.17500
MXO45-3C-28.3220	MXO45HS-3C-28.3220	28.32200
MXO45-3C-32.0000	MXO45HS-3C-32.0000	32.00000
MXO45-3C-40.0000	MXO45HS-3C-40.0000	40.00000
MXO45-3C-50.0000	MXO45HS-3C-50.0000	50.00000
MXO45-3C-64.0000	MXO45HS-3C-64.0000	64.00000
MXO45-3C-66.66666	MXO45HS-3C-66.66666	66.66666
MXO45-3C-80.0000	MXO45HS-3C-80.0000	80.00000

STANDARD PART NUMBERS - 636

PART NUMBER*	FREQUENCY (MHz)
636L3C014M31818	14.31818
636L3C014M74560	14.74560
636L3C016M00000	16.00000
636L3C016M38400	16.38400
636L3C018M43200	18.43200
636L3C020M00000	20.00000
636L3C020M48000	20.48000
636L3C024M00000	24.00000
636L3C025M00000	25.00000
636L3C032M76800	32.76800
636L3C033M00000	33.00000
636L3C044M00000	44.00000
636L3C048M00000	48.00000

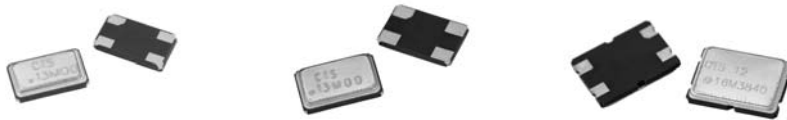
STANDARD PART NUMBERS - 357

PART NUMBER*	FREQUENCY (MHz)
357LB3I001M5440	1.5540
357LB3I004M0960	4.0960
357LB3I006M1760	6.1760
357LB3I016M3840	16.3840
357LB3I019M4400	19.4400
357LB3I020M0000	20.0000
357LB3I027M0000	27.0000
357LB3I032M7680	32.7680
357LB3I035M3280	35.3280
357LB3I038M8800	38.8800
357LB3I040M0000	40.0000
357LB3I044M7360	44.7360

*For Tri-State Output, Insert the letter "T"
after MXO45 and before the Frequency ie: MXO45T-3C-1.0000

Many Other Frequencies Available upon request.

SMD CRYSTALS



Models	MODEL 403	MODEL 405	MODEL 406
Package	2.5 x 3.2 x 0.8mm	3.2 x 5 x 0.9mm	3.5 x 6 x 1.2mm
Frequency Range	13 TO 50 MHz	11 TO 44 MHz	8 TO 50 MHz
Frequency Tolerance @25°C	403C35 = +/- 30ppm 403C11 = +/- 10ppm	+/- 30ppm	+/- 30ppm
Frequency Stability	403C35 = +/- 50ppm 403C11 = +/- 10ppm	+/- 50ppm	+/- 50ppm
Operating Temperature	-20°C to +70°C	-20°C to +70°C	-20°C to +70°C
Aging	<5ppm per year	<5ppm per year	<5ppm per year
ESR	50 to 90 Ohms (frequency dependent)	Max 50 Ohms	40 to Ohms (frequency dependent)
Load Capacitance	20 pF	13 pF	13pF
Standard Packaging	1000pc Tape & Reel	1000pc Tape & Reel	1000pc Tape & Reel
RoHS Compliant	Yes	Yes	Yes

STANDARD PART NUMBERS - 403

PART NUMBER*	FREQUENCY (MHz)
403C35E13M00000	13.00000
403C11E16M00000	16.00000
403C35E26M00000	26.00000
403C35E27M00000	27.00000
403C11E32M00000	32.00000

STANDARD PART NUMBERS - 405

PART NUMBER*	FREQUENCY (MHz)
405C35B11M05920	11.05920
405C35B12M00000	12.00000
405C35B12M80000	12.80000
405C35B13M00000	13.00000
405C35B14M31818	14.31818
405C35B14M40000	14.40000
405C35B14M74560	14.74560
405C35B15M36000	15.36000
405C35B16M00000	16.00000
405C35B16M36800	16.36800
405C35B19M20000	19.20000
405C35B19M68000	19.68000
405C35B20M00000	20.00000
405C35B24M00000	24.00000
405C35B25M00000	25.00000
405C35B26M00000	26.00000
405C35B32M00000	32.00000
405C35B33M00000	33.00000
405C35B40M00000	40.00000
405C35B44M00000	44.00000

STANDARD PART NUMBERS - 406

PART NUMBER*	FREQUENCY (MHz)
406C35B10M00000	10.00000
406C35B10M24500	10.24500
406C35B12M28800	12.28800
406C35B12M68800	12.68800
406C35B13M00000	13.00000
406C35B13M22500	13.22500
406C35B14M00000	14.00000
406C35B14M31818	14.31818
406C35B14M85000	14.85000
406C35B18M43200	18.43200
406C35B19M44000	19.44000
406C35B20M48000	20.48000
406C35B22M00000	22.00000
406C35B24M57600	24.57600
406C35B27M00000	27.00000
406C35B30M00000	30.00000
406C35B32M76800	32.76800
406C35B35M32800	35.32800
406C35B38M88000	38.88000
406C35B44M54500	44.54500
406C35B48M00000	48.00000

CRYSTALS



Models	ATS	MP-MICROPROCESSOR
Package	HC/49U/S & Surface Mount	HC/49U
Frequency Range	3.5 to 40 MHz	1.8 TO 48 MHz
Frequency Tolerance @25°C	+/- 30ppm	+/- 50ppm
Frequency Stability	+/- 50ppm	+/- 50ppm
Operating Temperature	-20°C to + 70°C	-20°C to + 70°C
Aging	<5ppm per year	<10ppm per year
ESR	40 to 150 Ohms (frequency dependent)	35 to 750 Ohms (frequency dependent)
Load Capacitance	See Frequency Table	See Frequency Table
Standard Packaging	SM 1000pc T&R / 100pc Bulk	100pc Bulk
RoHS Compliant	Date Code 0514	Date Code 0514

STANDARD PART NUMBERS - ATS (frequencies in **bold** are most popular)

PART NUMBER	FREQUENCY (MHz)	LOAD/SERIES
ATS036	3.57955	18pF
ATS036SM	3.57955	18pF
ATS036SM-1	3.57955	18pF
ATS037	3.68640	20pF
ATS037SM	3.68640	20pF
ATS037SM-1	3.68640	20pF
ATS040	4.00000	20pF
ATS040SM	4.00000	20pF
ATS040SM-1	4.00000	20pF
ATS042	4.91520	20pF
ATS042SM	4.91520	20pF
ATS042SM-1	4.91520	20pF
ATS050	5.06880	20pF
ATS050SM	5.06880	20pF
ATS050SM-1	5.06880	20pF
ATS060	6.00000	20pF
ATS060SM	6.00000	20pF
ATS060SM-1	6.00000	20pF
ATS08A	8.00000	20pF
ATS08ASM	8.00000	20pF
ATS08ASM-1	8.00000	20pF
ATS098	9.83040	20pF
ATS098SM	9.83040	20pF
ATS098SM-1	9.83040	20pF
ATS100	10.00000	Series
ATS100SM	10.00000	Series
ATS100SM-1	10.00000	Series
ATS111	11.05920	20pF

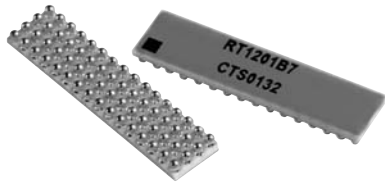
PART NUMBER	FREQUENCY (MHz)	LOAD/SERIES
ATS111SM	11.05920	20pF
ATS111SM-1	11.05920	20pF
ATS120	12.00000	Series
ATS120SM	12.00000	Series
ATS120SM-1	12.00000	Series
ATS122	12.28800	20pF
ATS122SM	12.28800	20pF
ATS122SM-1	12.28800	20pF
ATS143	14.31818	Series
ATS143SM	14.31818	Series
ATS143SM-1	14.31818	Series
ATS15A	15.36000	20pF
ATS15ASM	15.36000	20pF
ATS15ASM-1	15.36000	20pF
ATS160	16.00000	Series
ATS160SM	16.00000	Series
ATS160SM-1	16.00000	Series
ATS16A	16.00000	20pF
ATS200	20.00000	Series
ATS200SM	20.00000	Series
ATS200SM-1	20.00000	Series
ATS204	20.48000	20pF
ATS204SM	20.48000	20pF
ATS204SM-1	20.48000	20pF
ATS245	24.57600	Series
ATS245SM	24.57600	Series
ATS245SM-1	24.57600	Series
ATS250	25.00000	Series

STANDARD PART NUMBERS -MP CRYSTALS (frequencies in **bold** are most popular)

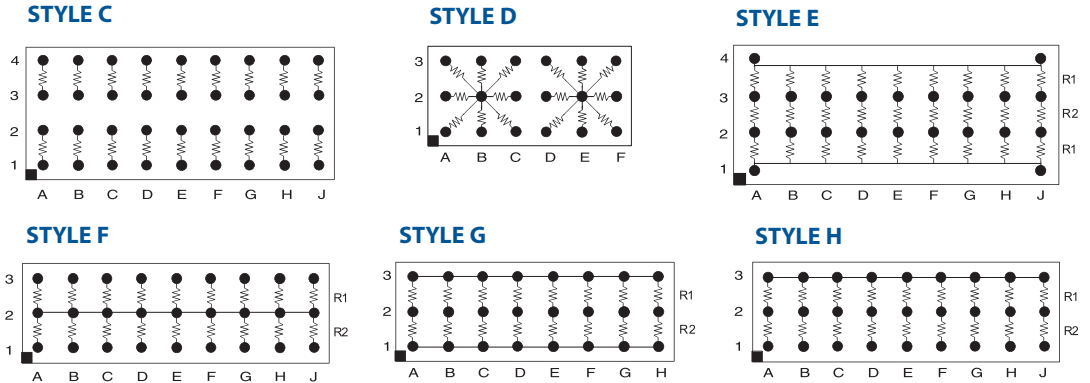
PART NUMBER	FREQUENCY (MHz)	LOAD/SERIES
MP018S	1.84320	13pF
MP020S	2.00000	20pF
MP024S	2.45760	32pF
MP036S	3.57955	18pF
MP037	3.68640	20pF
MP040	4.00000	20pF
MP04A	4.00000	Series
MP041	4.19430	12pF
MP042	4.91520	20pF
MP05A	5.00000	20pF
MP05B	5.00000	Series
MP050	5.06880	Series
MP060	6.00000	20pF
MP061	6.14400	20pF
MP073	7.37280	Series
MP080	8.00000	Series
MP080A	8.00000	20pF
MP098	9.83040	20pF
MP100	10.00000	Series
MP101	10.00000	30pF
MP107	10.73864	32pF
MP110	11.00000	18pF
MP111	11.05920	Series
MP120	12.00000	Series
MP122	12.28800	32pF
MP143	14.31818	Series
MP147	14.74560	Series
MP150	15.00000	Series
MP160	16.00000	Series
MP184	18.43200	Series
MP196	19.66080	Series
MP200	20.00000	Series
MP221	22.11840	Series
MP240	24.00000	Series
MP245	24.57600	Series
MP250	25.00000	Series

Many Other Frequencies Available upon request.

"-1" Indicates Tape & Reel (could also be indicated with a "T")



ClearONE® RT



ClearONE® RT Series Standard Part Numbers - Additional designs available upon request

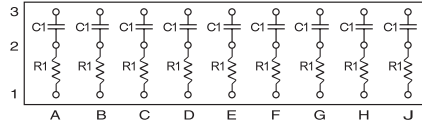
Application	Standard Part No. 1.27 mm Pitch	Standard Part No. 1.00 mm Pitch	RoHS Part No. 1.27 mm Pitch	RoHS Part No. 1.00 mm Pitch	Style	Array Size	Bits	R1Ω	R2Ω
DDR SDRAM	RT 1400 B6	RT 1400 B7	RT 2400 B6	RT 2400 B7	H	3 X 9	9	50	25
	RT 1401 B6	RT 1401 B7	RT 2401 B6	RT 2401 B7	H	3 X 9	9	25	22
	RT 1402 B6	RT 1402 B7	RT 2402 B6	RT 2402 B7	F	3 X 9	9	50	-
	RT 1403 B6	RT 1403 B7	RT 2403 B6	RT 2403 B7	F	3 X 9	9	25	-
	RT 1404 B6	RT 1404 B7	RT 2404 B6	RT 2404 B7	C	4 X 9	9	25	-
	RT 1405 B6	RT 1405 B7	RT 2405 B6	RT 2405 B7	C	4 X 9	9	22	-
	RT 1407 B6	RT 1407 B7	RT 2407 B6	RT 2407 B7	F	3 X 9	9	35	-
	RT 1408 B6	RT 1408 B7	RT 2408 B6	RT 2408 B7	H	3 X 9	9	60	25
	RT 1430 B6	RT 1430 B7	RT 2430 B6	RT 2430 B7	F	3 X 9	9	60	-
	RT 1432 B6	RT 1432 B7	RT 2432 B6	RT 2432 B7	F	3 X 9	9	120	-
	RT 1460 B6	RT 1460 B7	RT 2460 B6	RT 2460 B7	C	4 X 9	9	50	-
RT 1463 B6	RT 1463 B7	RT 2463 B6	RT 2463 B7	C	4 X 9	9	33	-	
RT 1465 B6	RT 1465 B7	RT 2465 B6	RT 2465 B7	C	4 X 9	9	47	-	
LVD SCSI	RT 1300 B6	-	RT 2300 B6	-	E	4 X 9	9	475	121
COMPACT PCI, MEMORY & IDE	-	RT 1200 B7	-	RT 2200 B7	C	4 X 8	16	10	-
	-	RT 1201 B7	-	RT 2201 B7	C	4 X 16	32	10	-
	-	RT 1202 B7	-	RT 2202 B7	C	4 X 8	16	33	-
	-	RT 1232 B7	-	RT 2232 B7	C	4 X 8	16	22	-
	-	RT 1233 B7	-	RT 2233 B7	C	4 X 8	16	25	-
	-	RT 1235 B7	-	RT 2235 B7	C	4 X 8	16	50	-
	-	RT 1203 B7	-	RT 2203 B7	C	4 X 16	32	33	-
PCI & PCIX	-	RT 1205 B7	-	RT 2205 B7	C	4 X 16	32	50	-
	-	RT 1236 B7	-	RT 2236 B7	C	4 X 16	32	100	-
	RT 1415 B6	RT 1415 B7	RT 2415 B6	RT 2415 B7	F	3 X 4	8	4.7K	-
	RT 1416 B6	RT 1416 B7	RT 2416 B6	RT 2416 B7	F	3 X 4	8	8.2K	-
GTL, GTL+ & AGTL+	RT 1417 B6	RT 1417 B7	RT 2417 B6	RT 2417 B7	F	3 X 8	16	4.7K	-
	RT 1418 B6	RT 1418 B7	RT 2418 B6	RT 2418 B7	F	3 X 8	16	8.2K	-
	RT 1450 B6	-	RT 2450 B6	-	D	3 X 3	8	25	-
	RT 1451 B6	-	RT 2451 B6	-	D	3 X 6	16	25	-
	RT 1452 B6	-	RT 2452 B6	-	D	3 X 12	32	25	-
	RT 1453 B6	-	RT 2453 B6	-	D	3 X 3	8	56	-
	RT 1454 B6	-	RT 2454 B6	-	D	3 X 6	16	56	-
	RT 1427 B6	-	RT 2427 B6	-	D	3 X 12	32	56	-
	RT 1410 B6	-	RT 2410 B6	-	D	3 X 3	8	150	-
RT 1411 B6	-	RT 2411 B6	-	D	3 X 6	16	150	-	
RT 1412 B6	RT 1412 B7	RT 2412 B6	RT 2412 B7	D	3 X 12	32	150	-	
VME64 & LVPECL	-	RT 1210 B7	-	RT 2210 B7	G	3 X 8	8	330	470
	-	RT 1211 B7	-	RT 2211 B7	G	3 X 8	8	220	1800
	RT 1250 B6	RT 1250 B7	RT 2250 B6	RT 2250 B7	G	3 X 8	8	127	8.25

ClearONE® RT Series Operating Temperature Range: -55°C to +125°C

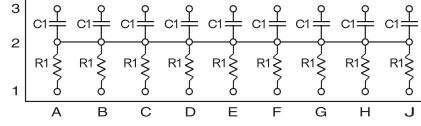


ClearONE® RC

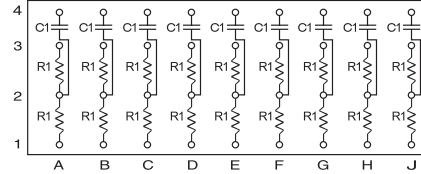
STYLE J



STYLE K



STYLE L

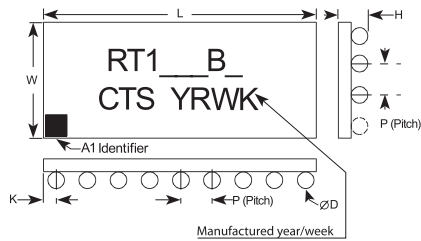


ClearONE® RC Series Standard Part Numbers

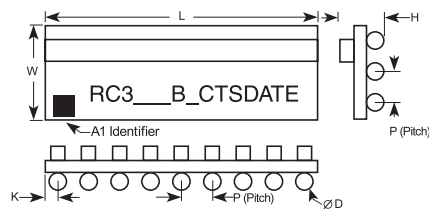
Application	1.27 mm Pitch Part No.	1.00 mm Pitch Part No.	Style	Array Size	R1 Ω	R1 Tol.	C1	C1 Tol.	Diel.	DF	Operating Temperature
Line Filter & Termination	-	RC 3002 B7	K	3 X 9	50	$\pm 1\%$	0.1uf	$\pm 10\%$	X5R	5% MAX.	-55°C TO +85°C
	RC 3005 B6	-	L	4 X 9	50	$\pm 1\%$	0.1uf	$\pm 10\%$	X5R	5% MAX.	-55°C TO +85°C
	RC 3007 B6	-	J	3 X 9	50	$\pm 1\%$	100pf	$\pm 10\%$	NPO	2.5% MAX.	-55°C TO +125°C
	RC 3008 B6	RC 3008 B7	J	3 X 9	50	$\pm 1\%$	33pf	$\pm 10\%$	NPO	2.5% MAX.	-55°C TO +125°C

Mechanical Outline

RT Series



RC Series



1.27 mm Pitch Package (B6 suffix)			
		mm	inch
P		1.27 \pm 0.25	.050 \pm .010
D		0.76 \pm 0.25	.030 \pm .002
K		0.64 \pm 0.25	.025 \pm .010
H		1.32 \pm 0.25	.052 \pm .006
H (RC)		2.03 MAX.	.080 MAX.
Array Size			
		L	W
3x3	mm	3.81 \pm 0.15	3.81 \pm 0.15
	inch	.150 \pm .006	.150 \pm .006
3x4	mm	5.08 \pm 0.15	3.81 \pm 0.15
	inch	.200 \pm .006	.150 \pm .006
3x6	mm	7.62 \pm 0.15	3.81 \pm 0.15
	inch	.300 \pm .006	.150 \pm .006
3x8	mm	10.16 \pm 0.15	3.81 \pm 0.15
	inch	.400 \pm .006	.150 \pm .006
3x9	mm	11.43 \pm 0.15	3.81 \pm 0.15
	inch	.450 \pm .006	.150 \pm .006
3x12	mm	15.24 \pm 0.15	3.81 \pm 0.15
	inch	.600 \pm .006	.150 \pm .006
4x9	mm	11.43 \pm 0.15	5.08 \pm 0.15
	inch	.450 \pm .006	.200 \pm .006

1.00 mm Pitch Package (B7 suffix)			
		mm	inch
P		1.00 \pm 0.25	.039 \pm .010
D		0.64 \pm 0.25	.025 \pm .002
K		0.50 \pm 0.25	.020 \pm .010
H		1.19 \pm 0.15	.047 \pm .006
H (RC)		1.83 MAX.	.072 MAX.
Array Size			
		L	W
3x4	mm	4.00 \pm 0.15	3.00 \pm 0.15
	inch	.157 \pm .006	.118 \pm .006
3x8	mm	8.00 \pm 0.15	3.00 \pm 0.15
	inch	.315 \pm .006	.118 \pm .006
3x9	mm	9.00 \pm 0.15	3.00 \pm 0.15
	inch	.354 \pm .006	.118 \pm .006
3x12	mm	12.00 \pm 0.15	3.00 \pm 0.15
	inch	.472 \pm .006	.118 \pm .006
4x8	mm	8.00 \pm 0.15	4.00 \pm 0.15
	inch	.315 \pm .006	.157 \pm .006
4x9	mm	9.00 \pm 0.15	4.00 \pm 0.15
	inch	.354 \pm .006	.157 \pm .006
4x16	mm	16.00 \pm 0.15	4.00 \pm 0.15
	inch	.630 \pm .006	.157 \pm .006

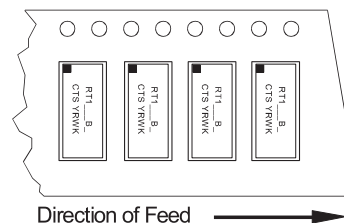
Tape and Reel Packaging

Suffix	RT Series TR7	RT Series TR13	RC Series TR7	RC Series TR13
Tape Width	24mm	24mm	24mm	24mm
Carrier Pitch	8mm	8mm	8mm	8mm
Reel Diameter	7 inch	13 inch	7 inch	13 inch
Parts/Reel	1,000	4,000	750	3,000

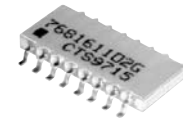
(Bulk Packaging Not Available)

Part Number Coding

7 inch reel, Add **TR7** to part number. Example: RT1200B7**TR7**
 13 inch reel, Add **TR13** to part number. Example: RT1200B7**TR13**



SURFACE MOUNT



	Narrow Body, Small Outline		Medium Body		Medium Body, Low Profile		
SERIES	766		767		768		
Termination Leads/Pins	14	16	14	16	14	16	20
Type	Flat		Flat		Flat		
Dimensions: Inches (mm)							
Center	.050 (1.27)		.050 (1.27)		.050 (1.27)		
Length	.340 (8.65)	.390 (9.90)	.390 (9.91)	.440 (11.18)	.390(9.91)	.440(11.18)	.540(13.70)
Width	.154 (3.90)		.220 (5.59)		.220 (5.59)		
Height	.061 (1.55)		.085 (2.16)		.063 (1.60)		
Resistance: Range, Ohms	10 Ω to 1 Meg Ω		10 Ω to 1 Meg Ω		10 Ω to 1 Meg Ω		
Tolerance	±2%		±2%		±2%		
Temperature Coefficient,ppm/°C	100 Ω to 1 Meg ± 100ppm/°C Typical		100 Ω to 1 Meg ± 100ppm/°C Typical		100 Ω to 1 Meg ± 100ppm/°C Typical		
Maximum Operating Voltage	50V		50V		50V		
Power Rating (Total Network Power)							
@70°C	1.0W	1.2W	1.3W	1.5W	1.3W	1.5W	2.0W
@25°C	1.6W	1.8W	2.0W	2.3W	2.0W	2.3W	3.0W
Operating Temperature Range	-55°C to +125°C		-55°C to +125°C		-55°C to +125°C		
Dielectric Strength	100V		100V		100V		
Packaging/Parts per Reel	TR7=800 pcs, TR13=3,000 pcs		TR13=2,000 pcs		TR13=2,000 pcs		

STANDARD RESISTOR VALUES & CODE (1 & 3 SCHEMATICS) FOR 766, 767 & 768 ±2% TOLERANCE
 "G" SUFFIX (22 Ω AND UP) * ±5% TOLERANCE "J" SUFFIX (LESS THAN 22 Ω) ONLY

OHMS	CODE	OHMS	CODE	OHMS	CODE	OHMS	CODE	OHMS	CODE
10*	100	100	101	1200	122	12000	123	120000	124
12*	120	110	111	1500	152	15000	153	150000	154
15*	150	120	121	1800	182	18000	183	180000	184
18*	180	150	151	2000	202	20000	203	200000	204
22	220	180	181	2200	222	22000	223	220000	224
27	270	200	201	2700	272	27000	273	270000	274
33	330	220	221	3300	332	33000	333	330000	334
39	390	270	271	3900	392	39000	393	390000	394
47	470	330	331	4700	472	47000	473	470000	474
51	510	390	391	5100	512	56000	563	560000	564
56	560	470	471	5600	562	68000	683	680000	684
68	680	510	511	6800	682	82000	823	820000	824
82	820	560	561	8200	822	100000	104	1000000	105
		680	681	10000	103				
		820	821						
		1000	102						

DUAL TERMINATOR VALUES & CODE (5 SCHEMATIC)

Ohm	Eq.Re	Code
180/390	120	121A
220/330	130	131A
330/390	180	181A
330/470	190	191A

Note:
Other Values Available On Request:
All 5 schematics are
±2% Resistance Tolerance

PART NUMBER EXAMPLE: 767143101GPTR13

767	14	3	101	G	P	TR13
Series	Number of Pins	Schematic	Resistor Code	Tolerance	RoHS	Packaging
766 767 768	14 16 20* <small>*Series 768 only</small>	1 = Bussed Resistors 3 = Isolated Resistors 5 = Dual Terminator	(see Resistance Value Code above)	1 & 3 J = ± 5% G = ± 2%	RoHS Part Numbers are Standard	TR = Tape & Reel SP = Slide Pack For 766 Specify TR7 = 7" Reel TR13 = 13" Reel

THROUGH-HOLE



		Conformal Coated SIP		
SERIES	770			
Termination Leads/Pins	6	8	10	
Type	Flat Copper Alloy Leads			
Dimensions: Inches (mm)				
Center	.100 (2.54)			
Length	.598 (15.19)	.798 (20.27)	.998 (25.35)	
Width	.095 (2.41) Max.			
Height	.195 (4.95) Max.			
Resistance: Range, Ohms	22Ω to 1MegΩ			
Tolerance	±2%			
Temperature Coefficient, ppm/°C	100Ω to 1MegΩ +100ppm/°C Typical			
Maximum Operating Voltage	100V			
Power Rating (Total Network Power)				
@70°C	0.64W	0.88W	1.11W	
@25°C	0.96W	1.32W	1.66W	
Operating Temperature Range	-55°C to +125°C			
Dielectric Strength	100V			
Packaging/Parts per Reel	Bulk Pack = 250 parts/bag			

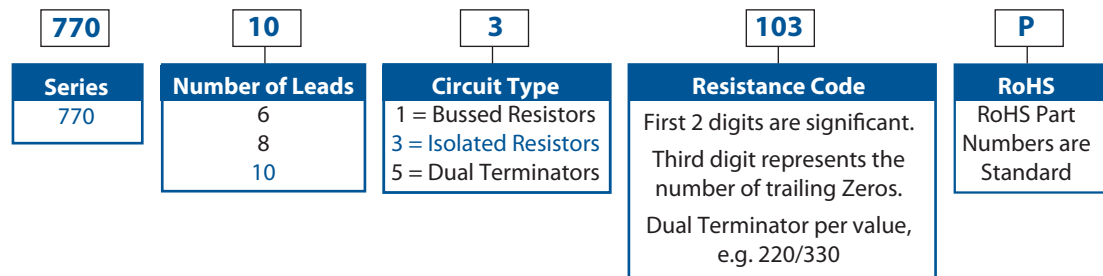
STANDARD RESISTOR VALUES & CODE (1 & 3 SCHEMATICS) FOR 770
± 2% TOLERANCE

OHMS	CODE	OHMS	CODE	OHMS	CODE	OHMS	CODE
22	220	270	271	3900	392	56000	563
27	270	330	331	4700	472	68000	683
33	330	390	391	5100	512	82000	823
39	390	470	471	5600	562	100000	104
47	470	510	511	6800	682	120000	124
51	510	560	561	8200	822	150000	154
56	560	680	681	10000	103	180000	184
68	680	820	821	12000	123	220000	224
82	820	1000	102	15000	153	270000	274
100	101	1200	122	18000	183	330000	334
110	111	1500	152	20000	203	390000	394
120	121	1800	182	22000	223	470000	474
150	151	2000	202	27000	273	560000	564
180	181	2200	222	33000	333	680000	684
200	201	2700	272	39000	393	820000	824
220	221	3300	332	47000	473	1000000	105

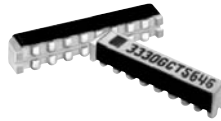
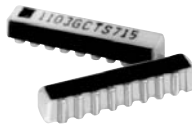
DUAL TERMINATOR VALUES & CODE (5 SCHEMATIC)

81/130
121/195
162/260
180/390
220/330
330/390
330/470

PART NUMBER EXAMPLE: 770103103P



LEADLESS NETWORKS



	Single Row Termination				Dual Row Termination				Single Row Termination				Dual Row Termination			
SERIES	752				752				753				753			
Termination: Pads (Resistors)	8	9	10	12	16	18	20	24	8	9	10	12	16	18	20	24
Type: C=Concave, X=Convex																
Dimensions: Inches (mm)																
Pitch	.050 (1.27)				.050 (1.27)				.025 (0.64)				.025 (0.64)			
Length	.465	.515	.565	.665	.465	.515	.565	.665	.245	.270	.295	.345	.245	.270	.295	.345
	(11.81)	(13.08)	(14.35)	(16.89)	(11.81)	(13.08)	(14.35)	(16.89)	(6.22)	(6.86)	(7.49)	(8.76)	(6.22)	(6.86)	(7.49)	(8.76)
Width	.080 (2.03)				.080 (2.03)				.080 (2.03)				.080 (2.03)			
Height	.095 (2.41)				.095 (2.41)				.095 (2.41)				.095 (2.41)			
Resistance: Range, Ohms	10Ω to 1MegΩ				10Ω to 1MegΩ				10Ω to 1MegΩ				10Ω to 1MegΩ			
Tolerance	±2%				±2%				±2%				±2%			
TCR ppm/°C	±200ppm/°C Typical				±200ppm/°C Typical				±200ppm/°C Typical				±200ppm/°C Typical			
Maximum Operating Voltage	25V				25V				25V				25V			
Power Rating (Per Resistor)																
@ 70°C	0.8W	.085W	0.9W	1.1W	0.9W	.095W	1.0W	1.3W	0.40W	.043W	0.45W	0.55W	0.40W	.043W	0.45W	0.55W
@ 25°C	1.2W	1.3W	1.4W	1.7W	1.4W	1.5W	1.6W	2.0W	0.60W	0.64W	0.68W	0.82W	0.60W	0.64W	0.68W	0.82W
Operating Temperature Range	-55°C to +125°C				-55°C to +125°C				-55°C to +125°C				-55°C to +125°C			
Dielectric Strength	100V				100V				100V				100V			
Packaging/Parts per Reel	TR7 = 1,000 pcs				TR7 = 1,000 pcs				TR7 = 1,000 pcs				TR7 = 1,000 pcs			
Packaging Bulk Plastic Bag	250				250				250				250			

STANDARD RESISTOR VALUES & CODE (1 & 3 SCHEMATICS) FOR 752 & 753
 ±2% TOLERANCE "G" SUFFIX (22 Ω AND UP) *±5% TOLERANCE "J" SUFFIX (LESS THAN 22 Ω) ONLY

OHMS	CODE	OHMS	CODE	OHMS	CODE	OHMS	CODE	OHMS	CODE
10*	100	110	111	1000	102	10000	103	120000	124
12*	120	120	121	1200	122	12000	123	150000	154
15*	150	150	151	1500	152	15000	153	180000	184
18*	180	180	181	1800	182	18000	183	200000	204
22	220	200	201	2000	202	20000	203	220000	224
27	270	220	221	2200	222	22000	223	270000	274
33	330	270	271	2700	272	27000	273	330000	334
39	390	330	331	3300	332	33000	333	390000	394
47	470	390	391	3900	392	39000	393	470000	474
51	510	470	471	4700	472	47000	473	560000	564
56	560	510	511	5100	512	56000	563	680000	684
68	680	560	561	5600	562	68000	683	820000	824
82	820	680	681	6800	682	82000	823	1000000	105
100	101	820	821	8200	822	100000	104		

DUAL TERMINATOR VALUES & CODE (5 SCHEMATIC)

Ohm	Eq.Re	Code
180/390	120	121A
220/330	130	131A
330/390	180	181A
330/470	190	191A
162/260	100	101B
81/130	50	500A

Note:
Other Values Available On Request:
All 5 schematics are
±2% Resistance Tolerance

PART NUMBER EXAMPLE: 752163101GPTR7

752	16	3	101	G	P	TR7
Series	Input/Outputs	Schematic	Resistor Code	Tolerance	RoHS	Packaging
752 753	SRT 08 09 10 12	DRT 16 18 20 24	1 = Bussed Resistors 3 = Isolated Resistors 5 = Dual Terminator	(see Resistance Value Code above)	1 & 3 J = ± 5% G = ± 2%	RoHS Part Numbers are Standard
						TR7 = Tape & Reel

CHIP ARRAYS



Chip Resistor Array		Chip Resistor Array		Chip Resistor Array			Chip Resistor Array		Chip Resistor Array		Chip Resistor Array		Chip Resistor Array		
740		741		742			743		744		745		746		
4(2)	4(2)	8(4)	16(8)	4(2)	8(4)	4(2)	4(2)	8(4)	4(2)	8(4)	10(8)	10(8)			
X	X	C, X	X	C	C, X	C	C		C		C or X		X		
.019 (.50)		.026(.65)		.020(.50)			.032 (.80)		.050 (1.27)		.050 (1.27)		.025 (.64)		
.033		.039		.079		.150		.063		.126		.252		.130	
(.85)		(1.00)		(2.00)		(3.80)		(1.60)		(3.20)		(6.40)		(3.30)	
.023		.039(1.0)		.063(1.60)			.063 (1.60)		.079 (2.00)		.126 (3.20)		.065 (1.65)		
(.60)		.014(.35)		.018(.45)		.024 (.60)		.024 (.60)		.024 (.60)		.024 (.60)		.024 (.60)	
10Ω to1MegΩ		10Ω to1MegΩ		10Ω to1MegΩ			10Ω to1MegΩ		10Ω to1MegΩ		33Ω to 470KΩ		33Ω to100KΩ		
±5%		±5%		±5%			±5%		±5%		±5%		±5%		
±200ppm/°C		±200ppm/°C		±200ppm/°C			±200ppm/°C		±200ppm/°C		±200ppm/°C		±200ppm/°C		
12.5V		25V		50V			100V		200V		50V		25V		
.031W		.063W		.063W			.100W		.125W		.063W		.031W		
-55° C to +125°C		-55° C to +125°C		-55° C to +125°C			-55° C to +125°C		-55° C to +125°C		-55° C to +125°C		-55° C to +125°C		
10,000		10,000		5,000		5,000		4,000		4,000		4,000		5,000	

STANDARD RESISTOR VALUES & CODE FOR SERIES 740, 741, 742, 743, 744, 745, & 746

OHMS	CODE	OHMS	CODE	OHMS	CODE	OHMS	CODE	OHMS	CODE
0.....	000X	82.....	820	820.....	821	8.2K.....	822	82K.....	823
10.....	100	100.....	101	1K.....	102	10K.....	103	100K.....	104
12.....	120	110.....	111	1.2K.....	122	12K.....	123	120K.....	124
15.....	150	120.....	121	1.5K.....	152	15K.....	153	150K.....	154
18.....	180	150.....	151	1.8K.....	182	18K.....	183	180K.....	184
22.....	220	180.....	181	2.2K.....	222	22K.....	223	220K.....	224
27.....	270	220.....	221	2.7K.....	272	27K.....	273	270K.....	274
33.....	330	270.....	271	3.3K.....	332	33K.....	333	330K.....	334
39.....	390	330.....	331	3.9K.....	392	39K.....	393	390K.....	394
47.....	470	390.....	391	4.7K.....	472	47K.....	473	470K.....	474
51.....	510	470.....	471	5.1K.....	512	51K.....	513	510K.....	514
56.....	560	510.....	511	5.6K.....	562	56K.....	563	560K.....	564
68.....	680	560.....	561	6.8K.....	682	68K.....	683	680K.....	684
75.....	750	680.....	681					820K.....	824
								1M.....	105

NOTE:
Series 745
33Ω to 470KΩ
Series 746
33Ω to 100KΩ

PART NUMBER EXAMPLE: 742C043101JP

742	C	04	3	101	J	P
Series	Termination	No. Terminations	Schematic	Resistor Code	Tolerance	RoHS
740 741 742 743 744 745 746	C = Concave X = Convex	04 08 16 (741 & 742 only) 10 (745 & 746 only)	1 = Bussed (745 & 746 only) 3 = Isolated (740, 741, 742, 743 & 744)	(see Resistance Value Code above)	J = ± 5%	RoHS Part Numbers are Standard



	Side Actuated Gull Wing	Side Actuated Gull Wing
SERIES	193	204
Positions	2 - 10	2 - 10 & 12
Initial Contact Resistance	50 Milliohms Max.	50 Milliohms Max.
Maximum Contact Resistance	100 Milliohms after 7,000 Cycles	100 Milliohms after 10,000 Cycles
Maximum Non-switching Rating	100 mA or 50 VDC	100 mA or 50 VDC
Insulation Resistance	1,000 Megohms	1,000 Megohms
Dielectric Breakdown	Min.: 500 VAC	Min.: 500 VAC
Switch Capacitance	Max.: 5.0 pF	Max.: 5.0 pF
Shock Mil-Std. 202F	No Damage with 25G Applied	< 1 microsecond
Vibration Mil-Std. 202F	No Damage at 60 Hz Constant Vibration	< 1 microsecond
Type of Actuation	Side Actuated	Slide (Top Actuated)
Circuitry Available	SPST	SPST; SPDT; 4PST; DPST; DPDT
Terminal Configuration	Gull Wing	Gull Wing
Dimensions: inches (mm)		
Length	"A" Dim. (See Table Below)	"A" Dim. (See Table Below)
Width	.410 (10.414)	.410* (10.414)
Height	.359 (9.12)	.359 (9.12)
Lead Centers	.100 (2.54)	.100 (2.54)
Contact Plating/Terminal Plating	Gold/Tin	Gold/Tin
Operating Temperature	-40° to +85°C	-55° to +85°C
Options:		
Bottom & Top Sealed	Bottom Seal Only Standard	Available
Low Profile Actuator	-	Available on SPST and SPDT
RoHS Compliant	Since June 2006	Since June 2006

* Gull Wing Terminal To Terminal

STANDARD PART NUMBERS FOR 193

"A" Overall Dimension	Number of Switch Sections	Series 193 Part Number
.286 (7.26)	2	193-2MS
.386 (9.80)	3	193-3MS
.486 (12.34)	4	193-4MS
.586 (14.88)	5	193-5MS
.686 (17.42)	6	193-6MS
.786 (19.96)	7	193-7MS
.886 (22.50)	8	193-8MS
.986 (25.04)	9	193-9MS
1.086 (27.58)	10	193-10MS

For Tape & Reel Add "R" to End of P/N
 EXAMPLE: 193-2MSR
 Even sizes only.

STANDARD PART NUMBERS FOR 204

"A" Overall Dimension	Number of Switch Sections	Actuation	Part Number	Both Bottom & Top Sealed	Low Profile Both Bottom & Top Sealed
.286 (7.26)	2	SPST	204-2	204-2ST	204-2LPST
.386 (9.80)	3	SPST	204-3	204-3ST	204-3LPST
.486 (12.34)	4	SPST	204-4	204-4ST	204-4LPST
.586 (14.88)	5	SPST	204-5	204-5ST	204-5LPST
.686 (17.42)	6	SPST	204-6	204-6ST	204-6LPST
.786 (19.96)	7	SPST	204-7	204-7ST	204-7LPST
.886 (22.50)	8	SPST	204-8	204-8ST	204-8LPST
.986 (25.04)	9	SPST	204-9	204-9ST	204-9LPST
1.086 (27.58)	10	SPST	204-10	204-10ST	204-10LPST
1.286 (32.66)	12	SPST	204-12	204-12ST	204-12LPST
.286 (7.26)	1	SPDT	204-121	204-121ST	
.486 (12.34)	2	SPDT	204-122	204-122ST	
.686 (17.42)	3	SPDT	204-123	204-123ST	
.886 (22.50)	4	SPDT	204-124	204-124ST	
1.086 (27.58)	5	SPDT	204-125	204-125ST	
1.286 (32.66)	6	SPDT	204-126	204-126ST	
.286 (7.26)	1	DPST	204-211	204-211ST	
.486 (12.34)	2	DPST	204-212	204-212ST	
.686 (17.42)	3	DPST	204-213	204-213ST	
.886 (22.50)	4	DPST	204-214	204-214ST	
1.086 (27.58)	5	DPST	204-215	204-215ST	
1.286 (32.66)	6	DPST	204-216	204-216ST	
.486 (12.34)	1	DPDT	204-221	204-221ST	
.886 (22.50)	2	DPDT	204-222	204-222ST	
1.286 (32.66)	3	DPDT	204-223	204-223ST	
.486 (12.34)	1	4PST	204-411	204-411ST	
.886 (22.50)	2	4PST	204-412	204-412ST	
1.286 (32.66)	3	4PST	204-413	204-413ST	

For Tape & Reel Add "R" to End of P/N
 Contact CTS for availability. EXAMPLE: 204-2STR



	Half Pitch (0.050")	Auto-Placeable
SERIES	218	219
Positions	2, 4, 6, 8, 10, 12	2 - 10 & 12
Initial Contact Resistance	100 Milliohms Max.	25 Milliohms Max.
Maximum Contact Resistance	100 Milliohms after 1,000 Cycles	50 Milliohms after 2,000 Cycles
Maximum Non-switching Rating	100 mA or 50 VDC	100 mA or 50 VDC
Insulation Resistance	1,000 Megohms	1,000 Megohms
Dielectric Breakdown	Min.: 500 VDC	Min.: 500 VDC
Switch Capacitance	Max.: 10.0 pF	Max.: 5.0 pF
Shock Mil-Std. 202F	< 1 microsecond	< 1 microsecond
Vibration Mil-Std. 202F	< 1 microsecond	< 1 microsecond
Type of Actuation	Slide (Top Actuated)	Slide (Top Actuated)
Circuitry Available	SPST	SPST
Terminal Configuration	Gull Wing & J Bend	Gull Wing & J Bend
Dimensions: inches (mm)		
Length	"A" Dim. (See Table Below)	"A" Dim. (See Table Below)
Width	.332* (8.43)	.390* (9.91)
Height	.104 (2.65)	.148 (3.76)
Lead Centers	.050 (1.27)	.100 (2.54)
Contact Plating/Terminal Plating	Gold/Gold	Gold/Tin
Operating Temperature	-55° to +85°C	-55° to +85°C
Options:		
Bottom & Top Sealed	Standard	Standard
Low Profile Actuator	Standard	Standard
RoHS Compliant	Since January 2005	Since June 2006

* Gull Wing Terminal To Terminal

STANDARD PART NUMBERS FOR 218

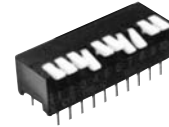
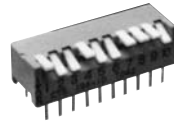
"A" Overall Dimension	No. of Switch Sections	Both Bottom & Top Sealed
.146 (3.71)	2	218-2LPST
.246 (6.25)	4	218-4LPST
.346 (8.79)	6	218-6LPST
.446 (11.33)	8	218-8LPST
.546 (13.87)	10	218-10LPST
.646 (16.41)	12	218-12LPST

For Tape & Reel Add "R" to End of P/N
EXAMPLE: 218-2LPSTR

STANDARD PART NUMBERS FOR 219

"A" Overall Dimension	No. of Switch Sections	Low Profile** Both Bottom & Top Sealed
.258 (6.55)	2	219-2 LPST
.358 (9.09)	3	219-3 LPST
.458 (11.63)	4	219-4 LPST
.558 (14.17)	5	219-5 LPST
.658 (16.71)	6	219-6 LPST
.758 (19.25)	7	219-7 LPST
.858 (21.79)	8	219-8 LPST
.958 (24.33)	9	219-9 LPST
1.058 (26.87)	10	219-10 LPST
1.258 (31.95)	12	219-12 LPST

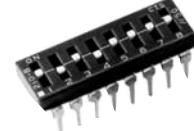
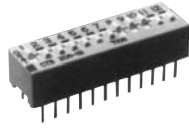
**For Medium Height Actuators, Replace "LP" With "M";
For Tape & Reel Add "R" To End Of P/N
EXAMPLES: 219-2MST
219-2LPSTR



	Side Actuated	Side Actuated
SERIES	194	195
Positions	2 - 10 & 12	2 - 10 & 12
Initial Contact Resistance	50 Milliohms Max.	100 Milliohms Max.
Maximum Contact Resistance	100 Milliohms after 7,000 Cycles	100 Milliohms after 2,000 Cycles
Maximum Non-switching Rating	100 mA or 50 VDC	100 mA or 50 VDC
Insulation Resistance	1,000 Megohms	1,000 Megohms
Dielectric Breakdown	Min.: 500 VAC	Min.: 500 VAC
Switch Capacitance	Max.: 5.0 pF	Max.: 5.0 pF
Shock Mil-Std. 202F, Method 213B Condition A	No Damage with 25G Applied	No Damage with 25G Applied
Vibration Mil-Std. 202F, Method 204D Condition B	No Damage at 60 Hz Constant Vibration	No Damage at 60 Hz Constant Vibration
Type of Actuation	Side Actuated	Side Actuated
Circuitry Available	SPST	SPST
Dimensions: inches (mm)		
Center	.100 (2.54)	.100 (2.54)
Length	"A" Dim. (See Table Below)	"A" Dim. (See Table Below)
Width	.385 (9.78)	.385 (9.78)
Height	.311 (7.90)	.311 (7.90)
Contact Plating/Terminal Plating	Gold/Tin	Tin/Tin
Operating Temperature	-40° to +85°C	-40° to +85°C
Options:		
Bottom & Top Sealed	Standard	Standard
Right Angle Mount	-	-
Low Profile Actuator	-	-
RoHS Compliant	Since June 2006	Since June 2006

STANDARD PART NUMBERS FOR 194 AND 195

"A" Overall Dimension	Number of Switch Sections	Series 194 Part Number	Series 195 Part Number
.286 (7.26)	2	194-2MST	195-2MST
.386 (9.80)	3	194-3MST	195-3MST
.486 (12.34)	4	194-4MST	195-4MST
.586 (14.88)	5	194-5MST	195-5MST
.686 (17.42)	6	194-6MST	195-6MST
.786 (19.96)	7	194-7MST	195-7MST
.886 (22.50)	8	194-8MST	195-8MST
.986 (25.04)	9	194-9MST	195-9MST
1.086 (27.58)	10	194-10MST	195-10MST
1.286 (32.66)	12	194-12MST	195-12MST



Economy Slide	Multifunctional Slide	Economy Slide	Auto-Insertable
205	206	208	209/210
2 - 10 & 12	2 - 10 & 12	2 - 10 & 12	2 - 10 & 12
50 Milliohms Max.	50 Milliohms Max.	100 Milliohms Max.	25 Milliohms Max.
100 Milliohms after 2,000 Cycles	100 Milliohms after 10,000 Cycles	500 Milliohms after 2,000 Cycles	25/100 Milliohms after 500/1000 Cycles
Maximum Rise of 30°C @ 5A	Maximum Rise of 30°C @ 5A	100 mA or 50 VDC	100 mA or 50 VDC
1,000 Megohms	1,000 Megohms	1,000 Megohms	1,000 Megohms
Min.: 500 VAC	Min.: 500 VAC	Min.: 500 VAC	Min.: 500 VDC
Max.: 5.0 pF	Max.: 5.0 pF	Max.: 5.0 pF	Max.: 5.0 pF
< 1 microsecond	< 1 microsecond	< 1 microsecond	< 1 microsecond
< 1 microsecond	< 1 microsecond	< 1 microsecond	< 1 microsecond
Slide (Top Actuated)	Slide (Top Actuated)	Slide (Top Actuated)	Slide (Top Actuated)
SPST	SPST; SPDT; 4PST; DPST; DPDT	SPST	SPST
.100 (2.54)	.100 (2.54)	.100 (2.54)	.100 (2.54)
"A" Dim (See Table Below)	"A" Dim (See Table Below)	"A" Dim (See Table Below)	"A" Dim (See Table Below)
.385 (9.78)	.385 (9.78)	.385 (9.78)	.263 (6.68)
.300 (7.62)	.300 (7.62)	.300 (7.62)	.148 (3.76)
Gold/Tin	Gold/Tin	Tin/Tin	(209)-Gold/Tin (210)-Gold Flash/Tin
-55° to +85°C	-55° to +85°C	-55° to +85°C	-40° to +85°C
Available	Available	Available	Standard
---	Available	Available - Contact CTS	---
---	Available - Contact CTS	Available - Contact CTS	Standard
Since June 2006	Since June 2006	Since June 2006	Since June 2006

STANDARD PART NUMBERS FOR 205 / 206

STANDARD PART NUMBERS FOR 208

"A" Overall Dimension	Number of Switch Sections	Actuation	Part Number	Both Bottom & Top Sealed	Low Profile Both Bottom & Top Sealed	Right Angle Mount Sealed Bottom & Top
.156 (3.96)	1	SPST	206-1	206-1ST	206-1LPST	---
.286 (7.26)	2	SPST	205/206-2	205/206-2ST	206-2LPST	206-2RAST
.386 (9.80)	3	SPST	205/206-3	205/206-3ST	206-3LPST	206-3RAST
.486 (12.34)	4	SPST	205/206-4	205/206-4ST	206-4LPST	206-4RAST
.586 (14.88)	5	SPST	205/206-5	205/206-5ST	206-5LPST	206-5RAST
.686 (17.42)	6	SPST	205/206-6	205/206-6ST	206-6LPST	206-6RAST
.786 (19.96)	7	SPST	205/206-7	205/206-7ST	206-7LPST	206-7RAST
.886 (22.50)	8	SPST	205/206-8	205/206-8ST	206-8LPST	206-8RAST
.986 (25.04)	9	SPST	205/206-9	205/206-9ST	206-9LPST	206-9RAST
1.086 (27.58)	10	SPST	205/206-10	205/206-10ST	206-10LPST	206-10RAST
1.286 (32.66)	12	SPST	205/206-12	205/206-12ST	206-12LPST	206-12RAST
.286 (7.26)	1	SPDT	206-121	206-121ST	---	206-121RAST
.486 (12.34)	2	SPDT	206-122	206-122ST	---	206-122RAST
.686 (17.42)	3	SPDT	206-123	206-123ST	---	206-123RAST
.886 (22.50)	4	SPDT	206-124	206-124ST	---	206-124RAST
1.086 (27.58)	5	SPDT	206-125	206-125ST	---	206-125RAST
1.286 (32.66)	6	SPDT	206-126	206-126ST	---	206-126RAST
.286 (7.26)	1	DPST	206-211	206-211ST	---	206-211RAST
.486 (12.34)	2	DPST	206-212	206-212ST	---	206-212RAST
.686 (17.42)	3	DPST	206-213	206-213ST	---	206-213RAST
.886 (22.50)	4	DPST	206-214	206-214ST	---	206-214RAST
1.086 (27.58)	5	DPST	206-215	206-215ST	---	206-215RAST
1.286 (32.66)	6	DPST	206-216	206-216ST	---	206-216RAST
.486 (12.34)	1	DPDT	206-221	206-221ST	---	206-221RAST
.886 (22.50)	2	DPDT	206-222	206-222ST	---	206-222RAST
1.286 (32.66)	3	DPDT	206-223	206-223ST	---	206-223RAST
.486 (12.34)	1	4PST	206-411	206-411ST	---	206-411RAST
.886 (22.50)	2	4PST	206-412	206-412ST	---	206-412RAST
1.286 (32.66)	3	4PST	206-413	206-413ST	---	206-413RAST

"A" Overall Dimension	No. of Switch Sections	Part No.	Both Bottom & Top Sealed
.156 (3.96)	1	208-1	208-1ST
.286 (7.26)	2	208-2	208-2ST
.386 (9.80)	3	208-3	208-3ST
.486 (12.34)	4	208-4	208-4ST
.586 (14.88)	5	208-5	208-5ST
.686 (17.42)	6	208-6	208-6ST
.786 (19.96)	7	208-7	208-7ST
.886 (22.50)	8	208-8	208-8ST
.986 (25.04)	9	208-9	208-9ST
1.086 (27.58)	10	208-10	208-10ST
1.286 (7.26)	11	208-12	208-12ST

STANDARD PART NUMBERS FOR 209/210

"A" Overall Dimension	No. of Switch Sections	Low Profile* Both Bottom & Top Sealed
.258 (7.26)	2	209/210-2LPST
.358 (9.80)	3	209/210-3LPST
.458 (12.34)	4	209/210-4LPST
.558 (14.88)	5	209/210-5LPST
.658 (17.42)	6	209/210-6LPST

* For Medium Height Actuators Replace "LP" with "M"
EXAMPLE: 209-2MST

THROUGH-HOLE



SERIES	201	262
Description	15mm Composition	10mm Conductive Plastics
Resistance Range	100 Ohms to 5 Megohm	500 Ohms to 2 Megohm
Resistance Tolerance	±20% Standard	±20% Standard
Power Rating, Watts	5000 Ohms and above 1/4 watt @ 55°C derated to no load @ 100°C Below 5000 Ohms 1/4 watt @ 40°C, .2 watt @ 55°C derated to no load @ 85°C	0.15 watts @ 40°C derated to no load @ 100°C
Voltage Rating	350 VDC	350 VDC
Resistance Tapers	Linear	Linear
Angle of Rotation	260° ±5°	265° ±5°
Turning Torque	0.75 to 6 inch-ounces	.3 to 5 inch-ounces
Stop Strength	2.5 inch-pounds	16 inch-ounces
Mounting Styles:		
X= Vertical	Available	Available
U= Horizontal	Available	Available
Operating Temperature	-35° to +85°C	-35° to +85°C
RoHS Compliant	Since September 2005	Since September 2005

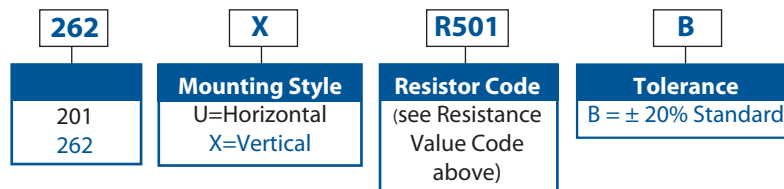
STANDARD RESISTOR VALUES FOR 201

Resistor Value in Ohms + 20%	Code	Type and Part Number	
		201X	201U
100	101	201XR101B	201UR101B
250	251	201XR251B	201UR251B
500	501	201XR501B	201UR501B
1000	102	201XR102B	201UR102B
2500	252	201XR252B	201UR252B
5000	502	201XR502B	201UR502B
10K	103	201XR103B	201UR103B
25K	253	201XR253B	201UR253B
50K	503	201XR503B	201UR503B
100K	104	201XR104B	201UR104B
250K	254	201XR254B	201UR254B
500K	504	201XR504B	201UR504B
1.0M	105	201XR105B	201UR105B

STANDARD RESISTOR VALUES FOR 262

Resistance Value in Ohms + 20%	Code	Knob Color	Type and Part Number	
			262X	262U
500	501	Green	262XR501B	262UR501B
1K	102	Yellow	262XR102B	262UR102B
2.5K	252	Red	262XR252B	262UR252B
5K	502	Blue	262XR502B	262UR502B
10K	103	White	262XR103B	262UR103B
25K	253	Black	262XR253B	262UR253B
50K	503	Orange	262XR503B	262UR503B
100K	104	Gray	262XR104B	262UR104B
250K	254	Violet	262XR254B	262UR254B
500K	504	Brown	262XR504B	262UR504B
1.0M	105	Light Blue	262XR105B	262UR105B

PART NUMBER EXAMPLE: 262XR501B



CERMET



SERIES	303	306	307
Description	3mm Surface Mount	6mm Square	6 mm Round
Resistance Range	100 Ohms to 1 Megohm	10 Ohms to 2 Megohm	100 Ohms to 1 Megohm
Resistance Tolerance	±25%	±20%	±25%
Power Rating, Watts	0.1 watt @ 70°C derated to no load @ 100°C	0.5 watt @ 70°C derated to no load @ 125°C	0.3 watt @ 70°C derated to no load @ 100°C
Voltage Rating	The lesser of 50V or $\sqrt{PR} = V$	The lesser of 200V or $\sqrt{PR} = V$	The lesser of 100V or $\sqrt{PR} = V$
Resistance Tapers	Linear	Linear	Linear
Angle of Rotation	270° ±20°	250° ±10°	240° ±10°
Turning Torque	19.6 mN·m Max	20 mN·m Max	29.4 mN·m Max
Stop Strength		50 mN·m Max	49 mN·m Max
Mounting Styles:			
X= Vertical - center terminal at rear		Available	Available
J= Vertical - center terminal forward		Available	
K= Vertical - inline terminals		Available	
U= Horizontal	Available	Available	Available
H= Horizontal - inline terminals		Available	
Operating Temperature	-40° to +100°C	-55° to +125°C	-25° to +100°C
Packaging			
Bulk		500/Bag	500/Bag
Tape & Reel - Vertical mount style		1000/Reel (K Mount)	1000/Reel (X Mount)
Tape & Reel - Horizontal mount style	2000/Reel	1000/Reel (H Mount)	800/Reel (U Mount)

Standard Values for 303		Standard Values for 306		Standard Values for 307	
Resistor value in ohms	Code	Resistor value in ohms	Code	Resistor value in ohms	Code
		10	100		
		20	200		
		50	500		
100	101	100	101	100	101
200	201	200	201	200	201
500	501	500	501	500	501
1000	102	1000	102	1000	102
2000	202	2000	202	2000	202
5000	502	5000	502	5000	502
10K	103	10K	103	10K	103
20K	203	20K	203	20K	203
50K	503	50K	503	50K	503
100K	104	100K	104	100K	104
200K	204	200K	204	200K	204
500K	504	500K	504	500K	504
1.0M	105	2.0M	205	1.0M	105

PART NUMBER EXAMPLE: 306HC202BR

306	H	C	202	B	R
Series 303 306 307	Horizontal Mount U=303/306/307 H=306 Vertical Mount X=306/307 J=306 K=306	Knob Type C = Cross-slot	Resistor Code (see Resistance Value Code above)	Tolerance B = 306 ± 20% E = 303/307 ± 25%	Packaging Blank=303 T&R Blank=306/307 Bulk R=306 T&R style H&K R= 307 T&R style U&X

IERC HEAT SINKS



FIGURE 1



FIGURE 2



FIGURE 3



FIGURE 4



FIGURE 5



FIGURE 6



FIGURE 7



FIGURE 8

Figure	Part Number	Description	Dimensions - Inches L x W x H	Thermal Resistance (Natural Convection °C/W)	
1	BDN09-3CB/A01	Various Semiconductors, Adhesive Backed	0.91 x .091 x .355	26.9	
	BDN10-3CB/A01		1.01 x 1.01 x .355	26.4	
	BDN10-5CB/A01		1.01 x 1.01 x .555	20.8	
	BDN11-3CB/A01		1.11 x 1.11 x .355	20.9	
	BDN12-3CB/A01		1.21 x 1.21 x .355	19.6	
	BDN12-5CB/A01		1.21 x 1.21 x .555	16.5	
	BDN13-3CB/A01		1.31 x 1.31 x .355	16.1	
	BDN14-3CB/A01		1.41 x 1.41 x .355	16.2	
	BDN15-3CB/A01		1.51 x 1.51 x .355	15.1	
	BDN15-5CB/A01		1.51 x 1.51 x .555	11.9	
	BDN16-3CB/A01		1.61 x 1.61 x .355	13.5	
	BDN17-3CB/A01		1.71 x 1.71 x .355	11.5	
	BDN18-3CB/A01		1.81 x 1.81 x .355	10.8	
	BDN18-6CB/A01		1.81 x 1.81 x .605	8.1	
	BDN21-3CB/A01		2.11 x 2.11 x .355	8.5	
Figure	Part Number	Description	Dimensions - Inches L x W x H	Thermal Resistance (°C/W @ 200 LFPM)*	
2	APR27-27-12CB/A01	Aluminum Forged for Various Semiconductors, Adhesive Backed	1.05 x 1.05 x .45	5.3	
	APR27-27-15CB/A01		1.05 x 1.05 x .57	4.4	
	APR27-27-20CB/A01		1.05 x 1.05 x .77	3.1	
	APR27-27-25CB/A01		1.05 x 1.05 x .97	2.8	
	APR35-35-12CB/A01		1.37 x 1.37 x .45	3.5	
	APR35-35-15CB/A01		1.37 x 1.37 x .57	2.9	
	APR35-35-20CB/A01		1.37 x 1.37 x .77	2.0	
	APR35-35-25CB/A01		1.37 x 1.37 x .97	1.8	
	APR40-40-12CB/A01		1.56 x 1.56 x .45	2.8	
	APR40-40-15CB/A01		1.56 x 1.56 x .57	2.3	
	APR40-40-20CB/A01		1.56 x 1.56 x .77	1.6	
	APR40-40-25CB/A01		1.56 x 1.56 x .97	1.4	
	APR43-43-12CB/A01		1.66 x 1.66 x .45	2.5	
	APR43-43-15CB/A01		1.66 x 1.66 x .57	2.0	
	APR43-43-20CB/A01		1.66 x 1.66 x .77	1.5	
	APR43-43-25CB/A01		1.66 x 1.66 x .97	1.2	
	CPR27-27-12U/A01		Copper Forged for Various Semiconductors, Adhesive Backed	1.05 x 1.05 x .45	4.6
	CPR27-27-15U/A01			1.05 x 1.05 x .57	4.0
	CPR27-27-20U/A01			1.05 x 1.05 x .77	2.9
	CPR27-27-25U/A01			1.05 x 1.05 x .97	2.5
	CPR35-35-12U/A01			1.37 x 1.37 x .45	3.0
	CPR35-35-15U/A01			1.37 x 1.37 x .57	2.6
	CPR35-35-20U/A01			1.37 x 1.37 x .77	1.8
	CPR35-35-25U/A01			1.37 x 1.37 x .97	1.7
	CPR40-40-12U/A01			1.56 x 1.56 x .45	2.4
CPR40-40-15U/A01	1.56 x 1.56 x .57	2.0			
CPR40-40-20U/A01	1.56 x 1.56 x .77	1.6			
CPR40-40-25U/A01	1.56 x 1.56 x .97	1.5			
CPR43-43-12U/A01	1.66 x 1.66 x .45	2.1			
CPR43-43-15U/A01	1.66 x 1.66 x .57	1.9			
CPR43-43-20U/A01	1.66 x 1.66 x .77	1.3			
CPR43-43-25U/A01	1.66 x 1.66 x .97	1.2			
Figure	Part Number	Description		Dimensions - Inches L x W x H	Thermal Resistance (Natural Convection °C/.5W)
3	TX0506-1B	T0-5, 6-32 Stud Mount, Black Cadmium Finish		.38 x .38 x .65	N/A
	TX0506-2B	T0-5, 10-32 Stud Mount, Black Cadmium Finish		.38 x .38 x .65	N/A
	TX0507-1B	T0-5, 6-32 Stud Mount, Black Cadmium Finish		.38 x .38 x .59	41.0
	TX0522B	T0-5, 4-40 Hex Nut Mount, Black Cadmium Finish		.38 x .38 x .47	N/A
	TX0522BF	T0-5, 4-40 Hex Nut Mount, Black Chemical Film Finish		.38 x .38 x .47	N/A
	TXB2-032-037B	T0-5, No Hardware, Black Cadmium Finish		.38 x .38 x .25	41.0
	TXB2P-032-037B	T0-5, 4-40 Screw Mount & Nylon Washer, Black Cadmium Finish		.38 x .38 x .37	41.0
	TXBE-032-031B	T0-5, Solder, Glue, Rivet Mount, Black Cadmium Finish		.38 x .38 x .31	41.0
	TX1806B	T0-18, 4-40 Stud Mount, BeO Washer, Black Cadmium Finish	.22 x .25 x .56	N/A	
	TX1807B	T0-18, 4-40 Stud Mount, Black Cadmium Finish	.22 x .25 x .50	54.0	
	TX1822B	T0-18, 2-56 x 1/4 Nut Mount, BeO Washer, Black Cadmium Finish	.22 x .25 x .34	N/A	
	TXB2-019-028B	T0-18, No Hardware, Black Cadmium Finish	.22 x .22 x .21	54.0	
TXB2P-019-028B	T0-18, 2-56 Screw Mount & Nylon Washer, Black Cadmium Finish	.22 x .22 x .28	54.0		
4	TXBF-032-025B	"T0-5, Fan Top, BeCu Material, Black Cadmium Finish	.75 x .75 x .25	40.0	
	TXBF-019-025B	"T0-18, Fan Top, BeCu Material, Black Cadmium Finish	.50 x .50 x .25	75.0	
Figure	Part Number	Description	Dimensions - Inches L x W x H	Thermal Resistance (Natural Convection °C/W)	
5	7-120-BA	T0-5, Aluminum with Black Anodize	.44 x .44 x .50	35.0	
6	7-156-BA	T0-18, Aluminum with Black Anodize	.22 x .22 x .40	75.0	
7	7-175-BA	T0-5, Aluminum with Black Anodize	.325 x .70 x .25	58.0	
8	7-192-BA	T0-126, 127, 202, 218, or 220, Black Anodize	.71 x 1.00 x .50	32.0	

* Thermal Resistance Values are without "A01" Adhesive Tape



Figure	Part Number	Description	Dimensions - Inches L x W x H	Thermal Resistance (Natural Convection °C/W)
9	7-338-1PP-BA	TO-220, Vertical Mount with Pins, Black Anodize	.50 x 1.38 x 1.50	13.0
	7-338-4PP-BA		.50 x 1.38 x 2.50	4.0
	7-339-1PP-BA		1.00 x 1.65 x 1.50	11.0
	7-339-3PP-BA		1.00 x 1.65 x 2.00	5.0
	7-339-4PP-BA		1.00 x 1.65 x 2.50	4.0
10	7-340-1PP-BA	TO-220, Vertical Mount, Black Anodize	.75 x 1.15 x .46	14.0
	7-340-3PP-BA	TO-220, Horizontal Mount, Black Anodize	.75 x 1.15 x .46	14.0
11	7-342-2PP-BA	Six TO-220, Horizontal Mount, Black Anodize	1.50 x 1.62 x .69	4.0
12	7-345-1PP-BA	TO-220, Horizontal/Vertical Mount, Black Anodize	.75 x 2.00 x .553	9.0
	7-345-2PP-BA	Dual TO-220, Universal Mount, Black Anodize	1.50 x 2.00 x .553	4.0
	7-345-3PP-BA	TO-220, Horizontal Mount, Black Anodize	.75 x 2.00 x .553	9.0
13	7-361-BA	TO-220, Horizontal/Vertical Mount, Black Anodize	.71 x .80 x .50	30.0
	7-362-BA	TO-220, Horizontal/Vertical Mount, Black Anodize	.71 x .80 x .34	38.0
	7-363-BA	TO-220, Vertical Mount with Tabs, Black Anodize	.83 x .80 x .50	23.0
14	7-370-BA	TO-126, 127, 202, 218, 220, Black Anodize	1.00 x .85 x .75	20.0
15	7-423-BA	TO-3, Power Cap, Black Anodize	1.06 x 1.56 x .50	32.0
16	LAIC3B2B	TO-3 IC, Military Black Anodize	1.63 x 1.29 x .50	15.0
	LAIC3B3CB	TO-3 IC, Black Anodize	1.63 x 1.29 x .75	11.0
	LAT03B2B	TO-3, Military Black Anodize	1.63 x 1.29 x .50	15.0
	LAT03B3B	TO-3, Military Black Anodize	1.63 x 1.29 x .75	11.0
	LAT03B4CB	TO-3, Black Anodize	1.63 x 1.29 x 1.00	9.0
	LAT03B7B	TO-3, Military Black Anodize	1.63 x 1.29 x .40	19.0
17	PC1-1CB	TO-220, Black Anodize	.75 x .75 x .375	27.3
18	PSB2-1CB	TO-126, 127, 220, Horizontal/Vertical Mount with Tabs, Black Anodize	1.40 x .88 x .25	25.9
	PSB2-1ND	TO-126, 127, 220, Horizontal/Vertical Mount with Tabs, Dull Nickel Finish		
19	PSC2-2CB	TO-220, Black Anodize	.81 x 1.00 x .31	41.7
	PSC2T-2CB	TO-220, Anti-Rotation Tabs, Black Anodize		
20	PA1-1CB	TO-126, 127, 220, Horizontal/Vertical Mount with Tabs, Black Anodize	.71 x 1.00 x .50	28.8
	PA2-1CB	TO-126, 127, 220, Horizontal/Vertical Mount with Tabs, Black Anodize	.71 x 1.00 x .31	30.0
21	PB1-2CB	Dual TO-126, 127, 220, Black Anodize	1.18 x 1.00 x .50	26.0
22	PB1-36CB	TO-126, 127, 220, Vertical Mount with Tabs, Black Anodize	1.33 x 1.00 x .50	20.0
	PB1-36ND	TO-126, 127, 220, Vertical Mount with Tabs, Dull Nickel Finish		
23	PB1ST-69CB	TO-220, Solderable Tabs, Black Anodize	1.18 x 1.00 x .50	20.0
24	HP1-T03-CB	TO-3, Horizontal Mount, Black Anodize	2.50 x 2.50 x .90	17.0
25	LAD66A2B	TO-66, Horizontal Mount, Military Black Anodize	1.31 x .90 x .50	25.0
	LAE66A3CB	TO126, TO220, Horizontal Mount, Black Anodize	1.31 x .90 x .75	20.0
	LAT0127B5CB	TO-220, Horizontal Mount, Black Anodize	1.63 x 1.29 x 1.25	12.0
26	PSE1-2CB	Dual TO-220, Vertical Mount with Tabs, Black Anodize	1.18 x 1.50 x .50	18.5
27	PVC-1B	TO-202, Clip, Black Cadmium	.45 x .38 x .20	39.0
28	UP-T03-CB	TO-3, Horizontal Mount, Black Anodize	1.78 x 1.78 x 1.00	9.0
	UP-T03-B	TO-3, Horizontal Mount, Military Black Anodize		
	UP1-T03-CB	TO-3, Horizontal Mount, Black Anodize	1.78 x 1.78 x .50	13.0
29	UP3-T03-CB	TO-3, Horizontal Mount, Black Anodize	1.50 x 1.38 x .44	19.0

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