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<th>Page</th>
</tr>
</thead>
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<tr>
<td>HX, HXX Types</td>
<td>18</td>
</tr>
<tr>
<td>HCS, HCTS, ACS, ACTS, Radiation Hardened Types</td>
<td>19</td>
</tr>
<tr>
<td>HIN Types</td>
<td>19</td>
</tr>
<tr>
<td>HIP Types</td>
<td>19</td>
</tr>
<tr>
<td>HMP Types</td>
<td>20</td>
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<tr>
<td>HMU/HMA Types</td>
<td>20</td>
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<tr>
<td>HS/IS Radiation Hardened Types</td>
<td>20</td>
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<tr>
<td>HSP Types</td>
<td>21</td>
</tr>
<tr>
<td>ICL, ICM Types</td>
<td>21</td>
</tr>
<tr>
<td>ICL Types (Interface Circuits)</td>
<td>22</td>
</tr>
<tr>
<td>JM JAN-QML Types</td>
<td>22</td>
</tr>
</tbody>
</table>
## ISL Types

<table>
<thead>
<tr>
<th>PREFIX</th>
<th>ISL</th>
<th>X</th>
<th>XXXX</th>
<th>I</th>
<th>XX</th>
<th>XXX</th>
<th>Z-T</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAMILY DESIGNATOR</td>
<td>1: DSL, RTC, Clocks, ATE, Energy LED Lighting</td>
<td>2: Reference, DCPs, Buffers, Sensors, Precision Op Amp, Precision ADC &amp; DAC</td>
<td>3: Interface, Data Communication</td>
<td>4: Analog Component Solutions</td>
<td>5: High Speed Amps, Switch/MUX, ADCs, DACs, Optical, Video, Telecom VoIP, DSP Function</td>
<td>6: Desktop Power</td>
<td>7: Space, Auto</td>
</tr>
</tbody>
</table>

### PART NUMBER
3 to 5 Digits

### OPTION
- **E**: 15kV ESD Protected
- **DCP Resistance Options**
  - **W**: 10k
  - **U**: 50k
  - **T**: 100k

### TEMPERATURE RANGE
- **C**: 0°C to +70°C (Commercial)
- **D**: 0°C to +85°C
- **H**: -10°C to +100°C (Hi-Temp Comm.)
- **E**: -20°C to +85°C (Extended Comm.)
- **I**: -40°C to +85°C (Industrial)
- **F**: -40°C to +125°C (Full-range Industrial)
- **P**: -40°C to +130°C (Power Supply)
- **M**: -55°C to +125°C (Military)

### PB-FREE OPTION
- **Z**: ROHS and IEC61249-2-21 Halogen Free

### SPECIAL SELECTIONS
Optional Characters to Denote Operating Conditions or Package Options:
- **18**: 1.8V
- **33**: 3.3V
- **EP**: Enhanced Product (DLA Vendor Item Drawing)
- **EPZ**: Enhanced Product w/100% Matte Tin Lead Finish
- **A, B etc.**: Firmware revision. This will not appear on part marking

### OPTIONAL ELECTRICAL GRADE
To Denote Speed or Precision Grading as Defined in Datasheet

### PACKAGE DESIGNATOR
- **A**: Shrink Small Outline Plastic (SSOP/QSOP)
- **B**: Small Outline Plastic (SOIC)
- **BE**: Exposed Pad SOIC (EPSOIC)
- **C**: Available
- **D**: Ceramic Dual-In-Line Metal Seal (SBDIP)
- **E**: Small Outline Transistor Plastic (SC-70)
- **F**: Ceramic Flatpack
- **FE**: Ceramic Flatpack w/Heatsink
- **G**: Single In-line Plastic (SIP) TO-220
- **GS**: Single In-line Plastic, Surface Mount (SIP) TO-263
- **H**: Small Outline Transistor Plastic (SOT-23)
- **HT**: Thin Small Outline Transistor Plastic (TSOT)
- **I**: Chip Scale Package (CSP)
- **J**: Ceramic Dual-In-Line Frit Seal (CERDIP)
- **K**: Ball Grid Array (FBGA/PBGA/LGA)
- **KE**: Heat Sink Ball Grid Array (HBGA)
- **KV**: Very Thin Fine Pitch BGA (VFBGA)
- **L**: Ceramic Leadless Chip Carrier (CLCC, SMD 0.5)
- **M**: Plastic Leaded Chip Carrier (PLCC)
- **N**: Thin Plastic Quad Flatpack (TQFP/LQFP)
- **NE**: Thin Plastic Quad Flatpack (TQFP/LQFP w/Exposed Pad)
- **O**: Do Not Use
- **P**: Dual-In-Line Plastic (PDIP)
- **Q**: Metric Plastic Quad Flatpack (MQFP/PQFP)
- **R**: Quad/Dual Flat No Lead (QFN/DFN)/HDA (High Density Array)
- **RA**: Array Flat No Lead (AFN)
- **RO**: Optical Quad/Dual Flat No Lead (QOQF/ODFN)
- **ROM**: Optical Quad/Dual Flat No Lead Module
- **RT**: Thin Quad/Dual Flat No Lead (TQFN/TDFN)
- **RU**: Ultra Thin Quad/Dual Flat No Lead (UTQFN/UTDFN/ePad UTQFN)
- **RS**: Top Exposed Pad QFN (TEPQFN)
- **RX**: Extreme Thin Flat No Lead (X2DFN/X2QFN)
- **S**: Header (TO-257)
- **T**: Metal Can (TO-39)
- **U**: Mini Small Outline Package (MSOP)
- **UE**: Thermally Enhanced Mini Small Outline Package (HMSOP)
- **UO**: Optical Mini Small Outline Package (OSOP)
- **V**: THIN Shrink Small Outline Plastic (TSSOP)
- **VE**: Thermally Enhanced Thin Shrink Small Outline Plastic (HTSSOP/EPTSSOP)
- **W**: Wafer Sale
- **WMB**: Wafer Sale With Solderable Metal Backing Layer
- **XM**: Die Sale, Military Visual (Condition B)
- **XC**: Die Sale, Commercial Visual
- **XB**: Die Sale, Bumped Die (FCP)
- **Y**: Available
- **Z**: Do Not Use

### SUFFIX/ POST PROCESSING/ SPECIAL SERVICES
- **-T**: Tape and Reel
- **-T1**: Tape and Reel
- **-T2**: Tape and Reel w/Vacuum Pack
- **-T7**: 7” Reel
- **-TS**: 7” Reel, 100pc.
- **-T7A**: 7” Reel, 250pc.
- **-T13**: 13” Reel
- **-T5**: 500pc Tape and Reel
- **-TK**: 1,000pc Tape and Reel
- **-T5K**: 5,000pc Tape and Reel
- **-EV**: Evaluation Board
- **-EVZ**: Evaluation Board ROHS Compliant
- **-DM**: Demo Board
- **-DMZ**: Demo Board ROHS Compliant
- **-RF**: Ref Design Eval Board
- **-RFZ**: Ref Design Eval Board ROHS Compliant
- **-EC**: Enhanced Commercial (Enhanced EOL, MIL-PRF-38535 Change Notice, Traceable to Wafer Lot)
## EL Types

### PACKAGE FAMILY

<table>
<thead>
<tr>
<th>PACKAGE TYPE</th>
<th>PACKAGE DESIGNATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bare Die</td>
<td>D</td>
</tr>
<tr>
<td>CerDip</td>
<td>J</td>
</tr>
<tr>
<td>QFN/DFN (Saw Singulate)</td>
<td>L</td>
</tr>
<tr>
<td>SO (0.300&quot;) and HSOP</td>
<td>M</td>
</tr>
<tr>
<td>PDIP</td>
<td>N</td>
</tr>
<tr>
<td>TSSOP (4.4 mm)</td>
<td>R</td>
</tr>
<tr>
<td>HTSSOP (4.4 mm)</td>
<td>RE</td>
</tr>
<tr>
<td>SO (0.150&quot;)</td>
<td>S</td>
</tr>
<tr>
<td>TO-220</td>
<td>T</td>
</tr>
<tr>
<td>QSOP</td>
<td>U</td>
</tr>
<tr>
<td>SOT-23</td>
<td>W</td>
</tr>
<tr>
<td>MSOP</td>
<td>Y</td>
</tr>
<tr>
<td>HMSOP</td>
<td>YE</td>
</tr>
<tr>
<td>TSOT</td>
<td>WT</td>
</tr>
<tr>
<td>SC-70</td>
<td>C</td>
</tr>
</tbody>
</table>

### PB-FREE OPTION

- Z: Pb-Free Product

### SUFFIX/POST PROCESSING/SPECIAL SERVICES

- T: Tape and Reel
- T7: 7" Reel
- T7A: 7" Reel (250 pcs)
- T13: 13" Reel

### TEMPERATURE RANGE

- C: (Commercial) 0°C to +70°C
- I: (Industrial) -40°C to +85°C
- M: (Military) -55°C to +125°C
- A: (Automotive) -40°C to +105°C
- D: 0°C to +85°C
- E: (Extended Comm) -20°C to +85°C

### EL Types Diagram

- **PREFIX**
- **EL**
- **1503**
- **A**
- **I**
- **Z**
- **PB-FREE OPTION**
- **-T**

- **PACKAGE TYPE**
- **OPTIONAL SUFFIX OR PART VARIATION**

- **TEMPERATURE RANGE**

- **PART NUMBER**
X Types

System Management Products (SMP)

<table>
<thead>
<tr>
<th>PREFIX</th>
<th>All Xicor Products</th>
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<tbody>
<tr>
<td>INTERFACE</td>
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</tr>
<tr>
<td>4</td>
<td>2-Wire Interface</td>
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<tr>
<td>5</td>
<td>SPI Interface</td>
</tr>
<tr>
<td>EEPROM MEMORY SIZE</td>
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</tr>
<tr>
<td>00</td>
<td>0kb</td>
</tr>
<tr>
<td>02</td>
<td>2kb</td>
</tr>
<tr>
<td>04</td>
<td>4kb</td>
</tr>
<tr>
<td>08</td>
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<td>28</td>
<td>128kb</td>
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<td>56</td>
<td>256kb</td>
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<tr>
<td>RESET POLARITY</td>
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</tr>
<tr>
<td>0</td>
<td>Active High</td>
</tr>
<tr>
<td>1</td>
<td>Active Low</td>
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<tr>
<td>3</td>
<td>Active Low</td>
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<td>4</td>
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<td>5</td>
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<td>7</td>
<td>Active High</td>
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<tr>
<td>8</td>
<td>Active Low</td>
</tr>
<tr>
<td>9</td>
<td>Active High</td>
</tr>
</tbody>
</table>

Real Time Clocks (RTC)

<table>
<thead>
<tr>
<th>PREFIX</th>
<th>XXXX S X</th>
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</thead>
<tbody>
<tr>
<td>PART NUMBER</td>
<td></td>
</tr>
<tr>
<td>PACKAGE DESIGNATOR</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>SOIC</td>
</tr>
<tr>
<td>V</td>
<td>TSSOP</td>
</tr>
<tr>
<td># PINS</td>
<td></td>
</tr>
<tr>
<td>8 Ld</td>
<td></td>
</tr>
<tr>
<td>14 Ld</td>
<td></td>
</tr>
<tr>
<td>16 Ld</td>
<td></td>
</tr>
</tbody>
</table>

TAPE AND REEL
T1: Tape and Reel
T2: Dry Pack

VOLTAGE TRIP POINT
2.7: 2.62V
2.7A: 2.85V or 2.92V
4.5A: 4.63V
(Blank): 4.38V or Other
A: Other
B: Other
C: Other

PB-FREE OPTION
Z: Pb-Free Product
ZA: Pb-Free with Anneal

TEMPERATURE RANGE
(Blank): Commercial 0°C to +70°C
I: Industrial -40°C to +85°C

EXCEPTIONS TO RESET POLARITY
X40015
X40231
X40233
X40035

EXCEPTIONS TO EEPROM MEMORY SIZE
X40030
X40031
X40034
X40035
X4C105

Nomenclature Guide Rev.6.00
Oct.12.20
Voltage References (VREFs)

PREFIX
FAMILY DESIGNATOR
Voltage References
PART NUMBER
4 Digits
PERFORMANCE GRADE
Refer to Datasheet for Details
TEMPERATURE RANGE
(blank): Commercial 0°C to +70°C
I: Industrial -40°C to +85°C
TAPE AND REEL
T1: Tape and Reel
T2: Dry Pack
OUTPUT VOLTAGE
-12: 1.25V
-25: 2.50V
-41: 4.096V
-50: 5.00V
PACKAGE DESIGNATOR
G3: 3 Ld SOT23
S8: 8 Ld SOIC

Digitally Controlled Potentiometers (DCPs)

PREFIX
FAMILY DESIGNATOR
90 to 96, also 9C
NOTE: Does not include X952x, X9530, X9601x, and 90100
PART NUMBER
2 to 3 digits
RESISTANCE OPTIONS
W: 10k
U: 50k
T: 100k
Y: 2k
M: 2/10/10/50
Z: 1k
PB-FREE OPTION
Z: Pb-Free Product
TEMPERATURE RANGE
(blank): Commercial (-45°C to +85°C)
I: Industrial (-45°C to +85°C)
PACKAGE DESIGNATOR
B: CSP
M: MSOP
P: PDIP
S: SOIC
U: T/DFN
V: TSSOP
## Digitally Controlled Capacitors (DCCs)

**Prefix**

<table>
<thead>
<tr>
<th>M</th>
<th>FAMILY DESIGNATOR</th>
</tr>
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<tbody>
<tr>
<td>MSOP</td>
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**Package Designator** (Followed by Lead Count)

<table>
<thead>
<tr>
<th>X</th>
<th>T1: Tape and Reel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>T2: Tape and Reel and Dry Pack</td>
</tr>
</tbody>
</table>

**Temperature Range**

<table>
<thead>
<tr>
<th>Blank</th>
<th>Commercial (0°C to +70°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Industrial (-40°C to +85°C)</td>
</tr>
</tbody>
</table>

**Pb-Free Option**

| Z | Pb-Free Product |

**Model Number**

<table>
<thead>
<tr>
<th>0</th>
<th>3 DCP with 2k Mem and V Monitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 DCP with 2k Mem</td>
</tr>
<tr>
<td>2</td>
<td>3 DCP with 2V Monitor</td>
</tr>
<tr>
<td>3</td>
<td>2 DCP with 2V Monitor</td>
</tr>
<tr>
<td>4</td>
<td>2 DCP with 2V Monitor</td>
</tr>
<tr>
<td>5</td>
<td>2 DCP with 2V Monitor Addressable</td>
</tr>
</tbody>
</table>

## Bias and Control for Laser Diode with Integrated DCP

**Prefix**

<table>
<thead>
<tr>
<th>X</th>
<th>T1: Tape and Reel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>T2: Tape and Reel and Dry Pack</td>
</tr>
</tbody>
</table>

**Pb-Free Option**

| Z | Pb-Free Product |

**Suffix**

See Datasheet for Specifications

**Package Designator** (Followed by Lead Count)

<table>
<thead>
<tr>
<th>B</th>
<th>CSP</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>TSSOP</td>
</tr>
</tbody>
</table>

## Bias and Control for Laser Diode

**Prefix**

<table>
<thead>
<tr>
<th>X</th>
<th>T1: Tape and Reel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>T2: Tape and Reel and Dry Pack</td>
</tr>
</tbody>
</table>

**Pb-Free Option**

| Z | Pb-Free Product |

**Package Designator** (Followed by Lead Count)

| V | TSSOP |
### General Purpose Sensor Conditioners with Look-Up Table Memory

#### Parallel E\(^2\)PROM

<table>
<thead>
<tr>
<th>PREFIX</th>
<th>FAMILY DESIGNATOR</th>
<th>SENSOR OPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>9601</td>
<td>1: Sensor Conditioner with Dual Look Up Table Memory and DAC</td>
</tr>
<tr>
<td>X</td>
<td></td>
<td>2: Temperature Sensor with Look Up Table Memory and DAC</td>
</tr>
<tr>
<td>Z</td>
<td></td>
<td>3: Universal Sensor Conditioner with Dual Look Up Table Memory and DACs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PACKAGE DESIGNATOR</th>
<th>(Followed by Lead Count)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1: Tape and Reel</td>
<td></td>
</tr>
<tr>
<td>T2: Tape and Reel and Dry Pack</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PB-FREE OPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z: Pb-Free Product</td>
</tr>
</tbody>
</table>

#### Serial E\(^2\)PROM

<table>
<thead>
<tr>
<th>PREFIX</th>
<th>FAMILY DESIGNATOR</th>
<th>SENSOR OPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>9601</td>
<td>1: Sensor Conditioner with Dual Look Up Table Memory and DAC</td>
</tr>
<tr>
<td>X</td>
<td></td>
<td>2: Temperature Sensor with Look Up Table Memory and DAC</td>
</tr>
<tr>
<td>Z</td>
<td></td>
<td>3: Universal Sensor Conditioner with Dual Look Up Table Memory and DACs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PACKAGE DESIGNATOR</th>
<th>(Followed by Lead Count)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1: Tape and Reel</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACCESS TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blank: 300ns</td>
</tr>
<tr>
<td>-25: 250ns</td>
</tr>
<tr>
<td>-20: 200ns</td>
</tr>
<tr>
<td>-15: 150ns</td>
</tr>
<tr>
<td>-90: 90ns</td>
</tr>
<tr>
<td>-70: 70ns</td>
</tr>
<tr>
<td>-55: 55ns</td>
</tr>
<tr>
<td>-45: 45ns</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEMPERATURE RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blank: Commercial (0°C to +70°C)</td>
</tr>
<tr>
<td>I: Industrial (-40°C to +85°C)</td>
</tr>
<tr>
<td>M: Military = -55°C to +125°C</td>
</tr>
<tr>
<td>MB: MIL-STD-883</td>
</tr>
<tr>
<td>MHR: Military High Rel</td>
</tr>
</tbody>
</table>

### Nomenclature Guide

**Part Number Format**

- **PREFIX**
- **FAMILY DESIGNATOR**
- **SENSOR OPTION**
- **PACKAGE DESIGNATOR**
- **PB-FREE OPTION**
- **PART NUMBER**
- **TAPE AND REEL**
- **ACCESS TIME**
- **TEMPERATURE RANGE**
- **VCC RANGE**
- **SPECIAL REQUIREMENT**

**Examples**

**Parallel E\(^2\)PROM**

X XXXX X -XX T1

**Serial E\(^2\)PROM**

X XXXX XX -XX T1

**VCC RANGE**

- Blank: 4.5V to 5.5V
- -3: 3V to 5.5V
- -2.7: 2.7V to 5.5V

**TEMPERATURE RANGE**

- Blank: Commercial (0°C to +70°C)
- I: Industrial (-40°C to +85°C)
- M: Military = -55°C to +125°C
- MB: MIL-STD-883
ZL Types

ZL = ZILKER LABS DESIGNATOR

BASE PART NUMBER
5 Character Max.

PACKAGE DESIGNATOR
A: (QFN)

OPERATING TEMPERATURE RANGE
J: (0°C to +85°C)
K: (0 to +70°C)
L: (-40°C to +85°C)
Z: (-55°C to +125°C)

FIRMWARE REVISION
Any alphanumeric character

LEAD FINISH
F (Lead-free Matte Tin)
N (Lead-free NiPdAu)

SHIPPING OPTION
J: (Trays)
T1 or TK: (Tape and Reel - 1000 piece)
T3: (Tape and Reel - 3000 piece)
T4: (Tape and Reel - 4000 piece)
T5: (Tape and Reel - 5000 piece)
T6: (Tape and Reel - 6000 piece)
T: (Tape and Reel - 100 piece for Zilker legacy products)
T: (Tape and Reel - Full reel Qty. for Intersil Zilker products)
W: (Waffle pack)

CUSTOM CODE
Any alphanumeric character

ZL Power Modules

ZL = ZILKER LABS DESIGNATOR

BASE PART NUMBER
6 Character Max.
ZL90XXM*: Power Modules
ZL91XXM*: Power Modules
ZLS4XXX: Module Component
*An alpha character succeeding the "M" represents a Firmware or Configuration change and will not appear on part marking

OPERATING TEMPERATURE RANGE
I: -40°C to +85°C

SHIPPING OPTION
No Suffix Trays
-T: Tape and Reel Full Reel Qty.
-TK: Tape and Reel 1000 pc.

PACKAGE DESIGNATOR
R: QFN

ZL Evaluation Boards

ZL = ZILKER LABS DESIGNATOR

BASE PART NUMBER
5 Character Max.

EVALUATION BOARD DESIGNATOR
EV = Evaluation Board

KIT OPTION
K = Kit containing collateral
Blank = Board only

CUSTOM CODE
Any alphanumeric character

BOARD VARIATION
Any number
KAD Types

- **PREFIX**
- **FAMILY SERIES**
- **NUMBER OF CHANNELS**
  - 1: Single
  - 2: Dual
  - 4: Quad
- **RESOLUTION**
  - 0: 10-Bit
  - 2: 12-Bit
  - 4: 14-Bit
- **DESCRIPTOR**
  - B: Buffered
  - P: Programmable
  - HP: High Performance
- **SPEED**
  - 12: 125 MSPS
  - 17: 170 MSPS
  - 21: 210 MSPS
  - 25: 250 MSPS
  - 50: 500 MSPS
- **LEAD COUNT**
- **PACKAGE STYLE**
  - Q: QFN

QLx Types

- **PREFIX**
- **PART NUMBER**
  - (Note 1)
- **EXTENSION**
  - RIQ: Generic Receive Side Equalizer
  - SIQ: Impedance Select Option
  - LIQ: LOS Option
  - IQ: Intersil-Quellan (introduced after Intersil acquisition of Quellan)
- **TAPE & REEL**
  - T7: 7” Production Tape & Reel, Quantity 1,000
  - SR: 7” Sample Tape & Reel, Quantity 100

Note:
1. Usually number of channels + data rate, for example, 4600: Quad 6G; 411G: Quad 11G.
### Active Cables

<table>
<thead>
<tr>
<th>PREFIX</th>
<th>QLx</th>
<th>XXXXX</th>
<th>XXX X</th>
<th>YYYY</th>
<th>LENGTH/GAUGE (Note 3)</th>
</tr>
</thead>
</table>

**Notes:**
1. Data Rate followed by Special Designator, followed by Customer Designator (if applicable), followed by “C” for cable.
   - Special Designators:
     0: Half-active (chip on RX side only)
     1: Generic full-active (chips on both TX and RX ends)
     2: Full-active Ethernet
   - Customer Designator:
     0: General market, other numbers for specific customers, for example: 600C (6G half-active cable), 4000C (40G half-active cable), 4100C (40G full-active cable)
2. For example, connector type or form-factor: SFP for SFP+, QSFP for QSFP, MSAS for Mini-SAS, SDP for mini DisplayPort, SDP for Standard DisplayPort, SMDP for mini-to-standard DisplayPort.
3. For example, 1028 = 10m 28 AWG.

### QL Evaluation Boards

<table>
<thead>
<tr>
<th>PREFIX</th>
<th>EBL</th>
<th>XXXXX</th>
<th>-EVALZ</th>
</tr>
</thead>
</table>

**Note:**
1. Same as the part marking on the respective IC.

### QHx Types

### Wireless Noise Cancellation Parts

<table>
<thead>
<tr>
<th>PREFIX</th>
<th>QHx</th>
<th>XXX</th>
<th>XX</th>
<th>XX</th>
<th>TAPE &amp; REEL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T7: 7” Production Tape &amp; Reel, Quantity 1,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SR: 7” Sample Tape &amp; Reel, Quantity 100</td>
</tr>
</tbody>
</table>

**Note:**
1. IQ: Intersil-Quellan (introduced after Intersil acquisition of Quellan)
**D2 Types**

```
D2 - aaaa-b R -TK
```

- **D2 = D2 AUDIO DESIGNATOR**
- **5 DIGIT PART NAME**
- **ROHS COMPLIANT**
- **TAPE & REEL**
  - TK: Quantity 1,000

**PACKAGE DESIGNATOR**
- L: LQFP
- Q: QFN
- M: HTSSOP

**RKP Types**

```
RKP - aaaa -TK
```

- **RKP = ROCK DESIGNATOR**
- **4 DIGIT PART NAME**
- **TAPE & REEL**
  - TK: Quantity 1,000
### TW Types

<table>
<thead>
<tr>
<th>PREFIX</th>
<th>TW</th>
<th>abbb</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
<th>g#</th>
<th>h</th>
<th>j</th>
<th>k</th>
<th>l</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEVICE NUMBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AT: Auto Wafer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EP: Epi Wafer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**c - PROCESS**
This character is included in the marking of legacy products only.

<table>
<thead>
<tr>
<th>PROCESS</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSMC, 0.35µm, Polycode, SPQM or SPTM Logic</td>
<td>A</td>
</tr>
<tr>
<td>TSMC, 0.25µm</td>
<td>B</td>
</tr>
<tr>
<td>X-FAB, 0.25µm</td>
<td>C</td>
</tr>
<tr>
<td>TSMC, 0.18µm</td>
<td>D</td>
</tr>
<tr>
<td>X-FAB, 0.18µm</td>
<td>E</td>
</tr>
<tr>
<td>TSMC, 0.18µm, EPI, Ar Anneal, Hi</td>
<td>G</td>
</tr>
<tr>
<td>Goyatek/Vanguard, 0.25µm</td>
<td>H</td>
</tr>
<tr>
<td>TSMC 0.25µm EPI, Ar Anneal, Hi</td>
<td>J</td>
</tr>
<tr>
<td>TSMC 0.18µm Automotive Process</td>
<td>K</td>
</tr>
<tr>
<td>TSMC 0.13µm</td>
<td>M</td>
</tr>
<tr>
<td>TSMC 90nm</td>
<td>N</td>
</tr>
<tr>
<td>Fujitsu 90nm</td>
<td>P</td>
</tr>
<tr>
<td>TSMC 0.13µm 12” Wafer</td>
<td>Q</td>
</tr>
<tr>
<td>TSMC 65nm</td>
<td>R</td>
</tr>
<tr>
<td>TSMC 45nm</td>
<td>S</td>
</tr>
</tbody>
</table>

**d - ASSEMBLY VENDOR**
This character is included in the marking of legacy products only.

<table>
<thead>
<tr>
<th>ASSEMBLY VENDOR</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASEK</td>
<td>A</td>
</tr>
<tr>
<td>ASECL</td>
<td>B</td>
</tr>
<tr>
<td>GAPT</td>
<td>C</td>
</tr>
<tr>
<td>i2a/IPAC, Quick Pak</td>
<td>D</td>
</tr>
<tr>
<td>SPIL</td>
<td>E</td>
</tr>
<tr>
<td>ChipMOS</td>
<td>G</td>
</tr>
<tr>
<td>UTAC</td>
<td>J</td>
</tr>
<tr>
<td>Fujitsu</td>
<td>K</td>
</tr>
<tr>
<td>Amkor Korea</td>
<td>M</td>
</tr>
</tbody>
</table>

**e -**
Q: 12” Wafer

**f - PACKAGE TYPE A**

<table>
<thead>
<tr>
<th>PACKAGE TYPE</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGA package</td>
<td>B</td>
</tr>
<tr>
<td>LQFP package</td>
<td>L</td>
</tr>
<tr>
<td>PQFP package</td>
<td>P</td>
</tr>
<tr>
<td>TQFP package</td>
<td>T</td>
</tr>
<tr>
<td>QFN package</td>
<td>N</td>
</tr>
<tr>
<td>PQFP package with Exposed Heat Spreader</td>
<td>E</td>
</tr>
</tbody>
</table>

**g# - DIE REVISION**
It starts from A1. If full layers are changed, the die revision changes like A1→B1→C1, etc.
If some layers are changed, the die revision changes like A1→A2→A3, etc.

**h - PACKAGE TYPE B**

<table>
<thead>
<tr>
<th>PACKAGE TYPE</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green (Halogen Free) and Lead Free package</td>
<td>G</td>
</tr>
<tr>
<td>Normal package</td>
<td>N</td>
</tr>
<tr>
<td>Green (Halogen Free) and Lead Free package with Cu Bond Wires</td>
<td>C</td>
</tr>
<tr>
<td>Flip Chip</td>
<td>F</td>
</tr>
</tbody>
</table>

**Note:** The following FG’s also use Cu wire:
- TW6815-LA1-QR
- TW6816-LA1-QR
- TW6817-LA1-QR
- TW6818-LA1-QR
- TW6932-LA1-QR

**i - OPTIONS**
- S = SLT
- B = Burn-in
- H = High Temp. Testing
- I = Industrial
- V = High Volt Testing
- T = Tape & Reel Packing

**k - PACKAGE VARIANT**
This is only used when one product type is offered in 2 different sizes or lead counts of the same package style. The last FG# created will include the lead count.

<table>
<thead>
<tr>
<th>PACKAGE VARIANT</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DROP-INS</td>
<td>D</td>
</tr>
<tr>
<td>Exposed heat spreader</td>
<td>E</td>
</tr>
<tr>
<td>Regular package without heat spreader</td>
<td>R</td>
</tr>
</tbody>
</table>

**j - PACKAGE TYPE C**

<table>
<thead>
<tr>
<th>PACKAGE TYPE</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drop-in heat spreader</td>
<td>D</td>
</tr>
<tr>
<td>Exposed heat spreader</td>
<td>E</td>
</tr>
<tr>
<td>Regular package without heat spreader</td>
<td>R</td>
</tr>
</tbody>
</table>

**k - PACKAGE VARIANT**
This is only used when one product type is offered in 2 different sizes or lead counts of the same package style. The last FG# created will include the lead count.

<table>
<thead>
<tr>
<th>PACKAGE VARIANT</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>This is only used when one product type is offered in 2 different sizes or lead counts of the same package style. The last FG# created will include the lead count.</td>
<td>128 (lead count)</td>
</tr>
</tbody>
</table>
# 5962 SMD/DLA - QML Types

<table>
<thead>
<tr>
<th>SMD ID NUMBER</th>
<th>5962 - XXXXX 0X X X X</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Does Not Change) (ID Not Applicable in Earlier DLA Items)</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL DOSE DESIGNATOR**
- Non-Rad Hard
  - M: 3krad(Si)
  - D: 10krad(Si)
  - P: 30krad(Si)
- L: 50krad(Si)
- R: 100krad(Si)
- F: 300krad(Si)

**DRAWING NUMBER**
(DLA and SMD)

**DEVICE TYPE**
(Paragraph 1.2.1 Of SMD/DLA Drawing)

**DEVICE CLASS DESIGNATOR**
(If Applicable)
- Q: QML Class Q (MIL-PRF-38535)
- M: QML Class B (MIL-STD-883)
- V: QML Class V, (MIL-PRF-38535)
- N: Non-Traditional Packages and Temp Ranges (i.e., Plastic Packages, -40°C to +85°C Temperature Range)
- T: QML Class T, Star*Lite Flow

**CASE OUTLINE**
Case Outlines are Listed in the Specific SMD and Detailed in MIL-STD-1835, Section 4.

**LEAD FINISH**
A: Solder Dip  
C: Gold

**Note:** Nomenclature Per MIL-PRF-38535

---

# 80C, 82CXXX Types

<table>
<thead>
<tr>
<th>TEMPERATURE RANGE</th>
<th>80C86 - 2 /B Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>M: 0°C to +70°C</td>
<td></td>
</tr>
<tr>
<td>D: -40°C to +85°C</td>
<td></td>
</tr>
<tr>
<td>P: -55°C to +125°C</td>
<td></td>
</tr>
</tbody>
</table>

**PACKAGE DESIGNATOR**
- P: Dual-In-Line Plastic (PDIP)
- D: Ceramic Dual-In-Line Frit-Seal (CERDIP)  
  or Ceramic Dual-In-Line Metal Seal (SBDIP)
- G: Ceramic Pin Grid Array (CPGA)
- R: Ceramic Leadless Chip Carrier (CLCC)
- S: Plastic Leaded Chip Carrier (PLCC)
- M: Small Outline Plastic (SOIC)
- MS: OKI Pin for Pin Cross (PLCC)
- MQ: OKI Pin for Pin Cross (MQFP)

**PART NUMBER**
- 80CXXX: CMOS Microprocessors  
- 82CXXX: CMOS Peripherals

**PB-FREE OPTION**
- Z: Pb-Free Product  
- ZA: Pb-Free with Anneal

**SUFFIX**
/B: -55°C to +125°C with Burn-In  
/883: Current Rev Compliant  
/T: Thin EPI, Current Rev 883 Compliant

**SPEED DESIGNATION**

<table>
<thead>
<tr>
<th>Peripheral</th>
<th>µProcessor</th>
</tr>
</thead>
<tbody>
<tr>
<td>-5: 5MHz</td>
<td>Blank: 5MHz</td>
</tr>
<tr>
<td>-2: 8MHz</td>
<td>Blank: 8MHz</td>
</tr>
<tr>
<td>-10: 10MHz</td>
<td>-10: 10MHz</td>
</tr>
<tr>
<td>-12: 12MHz</td>
<td>-12: 12MHz</td>
</tr>
<tr>
<td>-20: 20MHz</td>
<td>-20: 20MHz</td>
</tr>
<tr>
<td>-25: 25MHz</td>
<td>-25: 25MHz</td>
</tr>
</tbody>
</table>
### ACS, ACTS, HCS, HCTS Radiation Hardened Types

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>ACSXXX</th>
<th>D</th>
<th>MS</th>
<th>R</th>
<th>HARDNESS ASSURANCE LEVEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS, HCS:</td>
<td>ACSXXX</td>
<td></td>
<td></td>
<td></td>
<td>R: 200krad(Si) HCS/HCTS</td>
</tr>
<tr>
<td>ACTS, HCTS:</td>
<td></td>
<td>D</td>
<td></td>
<td></td>
<td>F: 300krad(Si) ACS/ACTS</td>
</tr>
</tbody>
</table>

**PACKAGE DESIGNATOR**
- D: Ceramic Dual-In-Line Metal-Seal (SBDIP)
- H: Die
- K: Ceramic Flatpack

**CLASS**
- MS: Class V *(Note 1)*
- T: QML Class T, Star*Lite Flow

**SUFFIX**
- 3: -55°C to +125°C Modified Class B
- 3W: Modified Class B without High & Low Temperature DC
- 96: Tape and Reel

**ELECTRICAL OPTIONS**
- A, B, C, Blank

**Note:**
1. FLIGHT UNITS MUST BE ORDERED BY SMD#.

### AD Types

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>ADC0803LC</th>
<th>WM</th>
<th>SUFFIX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Converters</td>
<td></td>
<td></td>
<td>-T</td>
</tr>
<tr>
<td>AD, ADC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PACKAGE DESIGNATOR**
- D: Ceramic Dual-In-Line Frit-Seal (CERDIP) or Ceramic Dual-In-Line Metal Seal (SBDIP)
- H: TO-52 Can
- N: Dual-In-Line Plastic (PDIP)
- WM: Small Outline Plastic (SOIC)

**SUFFIX**
- -T: Tape and Reel

### CA Types

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>CA3260</th>
<th>A</th>
<th>T</th>
<th>Z</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ELECTRICAL OPTIONS**
- A, B, C, Blank

**PACKAGE DESIGNATOR**
- D: Ceramic Dual-In-Line Metal-Seal (SBDIP)
- E: Dual-In-Line Plastic (PDIP)
- F: Ceramic Dual-In-Line Frit-Seal (CERDIP)
- J: Ceramic Leadless Chip Carrier (CLCC)
- M: Small Outline Plastic (SOIC)
- Q: Plastic Leaded Chip Carrier (PLCC)
- S: DIL Formed TO-5
- T: Can
- Z: Single-In-Line Plastic (SIP)
- Blank: See Data Sheet for Package Type

**PB-FREE OPTION**
- Z: Pb-Free Product
- ZA: Pb-Free with Anneal

**SUFFIX**
- 3: -55°C to +125°C Modified Class B
- 3W: Modified Class B without High & Low Temperature DC
- 96: Tape and Reel

**Note:**
If the part number contains three digits, add a leading zero when ordering. Example: CA555 becomes CA0555.
**CD22XXX Types**

- **PREFIX DESIGNATION** for Intersil Telecom ICs
- **PART NUMBER**
- **REVISION**
  - A: 1st
  - B: 2nd etc.
- **SCREENING OPTION**
  - X: Enhanced Product Screening i.e., Burn-In (Optional for D, E Package Types)
- **PACKAGE DESIGNATOR**
  - D: Ceramic Dual-In-Line Metal-Seal (SBDIP)
  - E: Dual-In-Line Plastic (PDIP)
  - F: Ceramic Dual-In-Line Frit-Seal (CERDIP)
  - M: Small Outline Plastic (SOIC)
  - Q: Plastic Leaded Chip Carrier (PLCC)
  - H: Chip

**X Suffix Product Flow**

- STANDARD PRODUCT → 100% BURN-IN 160 HR. AT +125°C OR EQUIVALENT → 100% PARAMETRIC AND FUNCTIONAL TESTS AT +25°C → SAMPLE PARAMETRIC AND FUNCTIONAL TESTS AT +25°C AQL = 0.025% → ENHANCED PRODUCT

**CD4000 Radiation Hardened Types**

- **PART NUMBER**
  - CD4000
- **SERIES**
  - B: Buffered
  - UB: Un-Buffered
- **PACKAGE DESIGNATOR**
  - D: Ceramic Dual-In-Line Metal-Seal (SBDIP)
  - H: Die
  - K: Ceramic Flatpack

**CLASS**
- MS: Class V (Note 1)
- NS: Class V with Neutron Irradiation (Note 1)
- T: Class T, Star*Lite Flow

**Note:**
1. FLIGHT UNITS MUST BE ORDERED BY SMD#.

**CDP Types**

- **PART NUMBER** (CMOS LSI)
  - CDP18XX
- **REVISION**
  - A: 1st
  - B: 2nd
- **VOLTAGE**
  - C: 5V Device

**PRODUCT ASSURANCE LEVEL**
- X: -40°C to +85°C with Burn-In
- 3: Non-Compliant with MIL-STD-883

**PACKAGE DESIGNATOR**
- D: Ceramic Dual-In-Line Metal-Seal (SBDIP)
- E: Dual-In-Line Plastic (PDIP)
- K: Ceramic Flatpack
- Q or N: Plastic Leaded Chip Carrier (PLCC)
### CDP68HC68 Types

<table>
<thead>
<tr>
<th>PART NUMBER (Peripherals)</th>
<th>CDP68HC68</th>
<th>T1</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>HC: Standard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FAMILY SERIES</td>
<td>A2, P1, R1, S1, T1, W1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CDP65C51 Types

<table>
<thead>
<tr>
<th>PART NUMBER (Peripherals)</th>
<th>CDP65C51</th>
<th>A</th>
<th>E</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAMILY SERIES</td>
<td>A: Non-Standard Clear to Send (CTS) Operation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Blank: Standard Clear to Send (CTS) Operation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>E</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>E: Dual-In-Line Plastic (PDIP)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M: Small Outline Plastic (SOIC)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>H: Chip</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SM: Shrink Small Outline Plastic (SSOP)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CD74HC Types

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>CD74</th>
<th>HC22106</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### DG Types

<table>
<thead>
<tr>
<th>DEVICE FAMILY PREFIX</th>
<th>DG</th>
<th>XXXX</th>
<th>X</th>
<th>X</th>
<th>Z</th>
<th>/883</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>TEMPERATURE RANGE</th>
<th>A: -55°C to +125°C</th>
<th>B: -25°C to +85°C</th>
<th>C: 0°C to +70°C</th>
<th>D: -40°C to +85°C</th>
</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PACKAGE DESIGNATOR</th>
<th>A: Can</th>
<th>J: Dual-In-Line Plastic (PDIP)</th>
<th>K: Ceramic Dual-In-Line Frit-Seal (CERDIP)</th>
<th>N: PLCC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>P: Ceramic Dual-In-Line Metal Seal (SBDIP)</td>
<td>V: Thin Shrink Small Outline Plastic (TSSOP)</td>
<td>Y: Small Outline Plastic (SOIC)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Y-T: Tape and Reel</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ZA: Pb-Free with Anneal</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PB-FREE OPTION</th>
<th>Z: Pb-Free Product</th>
<th>ZA: Pb-Free with Anneal</th>
</tr>
</thead>
</table>
# HX Types

**PREFIX**

<table>
<thead>
<tr>
<th>FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Analog</td>
</tr>
<tr>
<td>C: Communications</td>
</tr>
<tr>
<td>D: Digital</td>
</tr>
<tr>
<td>I: Interface</td>
</tr>
<tr>
<td>M: Memory</td>
</tr>
<tr>
<td>V: Analog High Voltage</td>
</tr>
</tbody>
</table>

**FAMILY**

| A: Analog |
| C: Communications |
| FA: Ultra-High Frequency Analog |
| I: Data Acquisition, DSP |
| V: Analog High Voltage |

**PACKAGE DESIGNATOR**

1: Ceramic Dual-In-Line Frit-Seal (CERDIP)
2: Can
3: Dual-In-Line Plastic (PDIP)
4P: Plastic Leaded Chip Carrier (PLCC)
6: Narrow Dual-In-Line Plastic (PDIP) or Ceramic Dual-In-Line Frit-Seal (CERDIP)
7: 8 Lead Ceramic Dual-In-Line Frit-Seal (CERDIP)
0: Chip

**TEMPERATURE RANGE**

- **-2:** -55°C to +125°C
- **-4:** -25°C to +85°C
- **-5:** 0°C to +75°C
- **-6:** +25°C Chip Probe
- **-7:** Dash-7 High Reliability
  Commercial Product 0°C to +75°C,
  Includes 96 hour Burn-In
- **-8:** -55°C to +125°C Intersil Class B Equivalent Devices for use in Military and Flight Systems
- **-9:** -40°C to +85°C
  /883: Fully Compliant to MIL-STD-883, Class B/QML
  BXXXX: Customer Specific Screening
  RXXXX: Customer Specific Screening
  SXXXX: Customer Specific Screening

**PB-FREE OPTION**

- **Z:** Pb-Free Product
- **ZA:** Pb-Free with Anneal

---

# HX, HXX Types

**PREFIX**

<table>
<thead>
<tr>
<th>H</th>
<th>A</th>
<th>4314B</th>
</tr>
</thead>
<tbody>
<tr>
<td>2: Can</td>
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</tr>
<tr>
<td>3: Dual-In-Line Plastic (PDIP)</td>
<td></td>
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</tr>
<tr>
<td>4P: Plastic Leaded Chip Carrier (PLCC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6: Narrow Dual-In-Line Plastic (PDIP) or Ceramic Dual-In-Line Frit-Seal (CERDIP)</td>
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<tr>
<td>7: 8 Lead Ceramic Dual-In-Line Frit-Seal (CERDIP)</td>
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</tr>
<tr>
<td>0: Chip</td>
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**FAMILY**

| A: Analog |
| C: Communications |
| FA: Ultra-High Frequency Analog |
| I: Data Acquisition, DSP |
| V: Analog High Voltage |

**PACKAGE DESIGNATOR**

A: Shrink Small Outline Plastic (SSOP)
B: Small Outline Plastic (SOIC)
D: Ceramic Dual-In-Line Metal-Seal (SBDIP)
H: Plastic Small Outline Transistor (SOT)
J: Ceramic Dual-In-Line Frit-Seal (CERDIP)
L: Ceramic Leadless Chip Carrier (CLCC)
M: Plastic Leaded Chip Carrier (PLCC)
N: Thin Quad Flatpack (TQFP), or Metric Quad Flatpack (MQFP)
Q: Metric Plastic Quad Flatpack (MQFP), or Plastic Quad Flatpack (PQFP)
P: Dual-In-Line Plastic (PDIP)
T: Can
Y: Chip (Commercial Visual)
W: Wafer

**TEMPERATURE RANGE**

- **C:** 0°C to +70°C
- **I:** -40°C to +85°C
- **M:** -55°C to +125°C

**PB-FREE OPTION**

- **Z:** Pb-Free Product
- **ZA:** Pb-Free with Anneal
HCS, HCTS, ACS, ACTS, Radiation Hardened Types

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>HCSXXX</th>
<th>D</th>
<th>MS</th>
<th>R</th>
<th>HARDNESS ASSURANCE LEVEL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>R: 200krad(Si) HCS/HCTS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F: 300krad(Si) ACS/ACTS</td>
</tr>
</tbody>
</table>

| PACKAGE DESIGNATOR | D: Ceramic Dual-In-Line Metal-Seal (SBDIP) | H: Die | K: Ceramic Flatpack |

| CLASS | MS: Class V (Note 1) | T: Class T, Star*Lite Flow |

Note:
1. FLIGHT UNITS MUST BE ORDERED BY SMD#.
A Cross Reference table is Available at:

HIN Types

<table>
<thead>
<tr>
<th>DEVICE FAMILY PREFIX</th>
<th>Interface</th>
<th>HIN</th>
<th>XXX</th>
<th>X</th>
<th>X</th>
<th>Z</th>
<th>T</th>
<th>TAPE AND REEL</th>
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<tbody>
<tr>
<td></td>
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<td>PB-FREE OPTION</td>
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<td></td>
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<td>Z: Pb-Free Product</td>
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<td></td>
<td></td>
<td></td>
<td>ZA: Pb-Free with Anneal</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>PB-FREE OPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Z: Pb-Free Product</td>
</tr>
<tr>
<td></td>
<td>ZA: Pb-Free with Anneal</td>
</tr>
</tbody>
</table>

| TEMPERATURE RANGE | C: Commercial (0°C to +70°C) | I: Industrial (-40°C to +85°C) |

HIP Types

<table>
<thead>
<tr>
<th>PREFIX</th>
<th>H</th>
<th>I</th>
<th>P</th>
<th>4082</th>
<th>I</th>
<th>B</th>
<th>Z</th>
<th>T</th>
<th>PACKING DESIGNATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T: Tape and Reel (If Available)</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
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<td>(See Note)</td>
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</table>

<table>
<thead>
<tr>
<th>PACKAGE DESIGNATOR</th>
<th>B: Small Outline Plastic (SOIC)</th>
<th>D: Chip</th>
<th>K: SOT-23</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M: Plastic Leaded Chip Carrier (PLCC)</td>
<td>P: Dual-In-Line Plastic (PDIP)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Q: Metric Plastic Quad Flatpack (MQFP)</td>
<td>S: Single-In-Line Plastic (SIP)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>V: TSSOP</td>
<td>W: Wafer</td>
<td>Y: Die</td>
</tr>
<tr>
<td></td>
<td>RT: Thin Quad/Dual Flat No Lead (TQFN/TDFN)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| SPECIAL SELECTIONS | Optional characters to denote operating conditions, voltage selections defined in datasheet |

<table>
<thead>
<tr>
<th>TEMPERATURE RANGE</th>
<th>A: Automotive (-40°C to +105°C)</th>
<th>C: Commercial (0°C to +70°C)</th>
<th>I: Industrial (-40°C to +85°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M: Military (-55°C to +125°C)</td>
<td>D: EDP (0°C to +85°C)</td>
<td>F: Full-Range Industrial (-40°C to +125°C)</td>
</tr>
</tbody>
</table>

Note: Suffix EVAL: Evaluation Kit (Available for some products).
HMP Types

<table>
<thead>
<tr>
<th>PREFIX</th>
<th>FAMILY</th>
<th>PART NUMBER</th>
<th>REVISION</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>MP: Multimedia Products</td>
<td>8117</td>
<td>If Applicable</td>
</tr>
</tbody>
</table>

**PACKAGE DESIGNATOR**
- N: Metric Plastic Quad Flatpack (PQFP)

**TEMPERATURE RANGE**
- C: Commercial, 0°C to +70°C

**Notes:**
- PQFP is also known as QFP and MQFP.

---

HMU/HMA Types

<table>
<thead>
<tr>
<th>PREFIX</th>
<th>FAMILY</th>
<th>DEVICE TYPE</th>
<th>PACKAGE DESIGNATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>MU: Multiplier</td>
<td>16, 17, 510</td>
<td>J: Plastic Leaded Chip Carrier (PLCC) G: Ceramic Pin Grid Array (CPGA)</td>
</tr>
</tbody>
</table>

**HIGH RELIABILITY DESIGNATOR**
- 883: -55°C to +125°C Fully Compliant to MIL-STD-883, Class B/QML

**PERFORMANCE GRADE**
- -35: 35ns
- -45: 45ns
- -55: 55ns
- -60: 60ns
- -65: 65ns
- -75: 75ns

**TEMPERATURE RANGE**
- C: Commercial, 0°C to +70°C
- I: Industrial, -40°C to +85°C
- M: Military, -55°C to +125°C

**Notes:**
- PQFP is also known as QFP and MQFP.

---

HS/IS Radiation Hardened Types

<table>
<thead>
<tr>
<th>PREFIX</th>
<th>FAMILY</th>
<th>PACKAGE DESIGNATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>Rad Hard/High-Rel Products</td>
<td>1: Ceramic Dual-In-Line Frit-Seal (CERDIP) or Ceramic Dual-In-Line Metal-Seal (SBDIP) 2: Can 4: Ceramic Leadless Chip Carriers (CLCC) 7B: 8 Lead Ceramic Dual-In-Line Side-Brazed (SBDIP) 8: Ceramic Pin Grid Array (CPGA) 9: Ceramic Flatpack 0: Die YE: SMD 0.5 9S: TO-257 Hermetic Surface Mount</td>
</tr>
</tbody>
</table>

**CLASS**
- -8: -55°C to +125°C QML SMD Class Q (Note 1)
- -Q: -55°C to +125°C QML SMD Class V (Note 1)
- -T: -55°C to +125°C QML SMD Class T (Note 1)
- /PROTO: -55°C to +125°C Temperature Tested (Note 2)

**HARDNESS**
- RH: Radiation Hardened (Note 3)
- EH: Radiation Hardened (Note 3)

**Notes:**
1. ***FLIGHT UNITS MUST BE ORDERED BY SMD#***.
   A cross reference table is available [here](https://www.renesas.com/us/en/products/space-hard-environment.html#resources)
2. /PROTO available for design-in/breadboarding - NOT FOR FLIGHT.
3. See specific device type SMD for radiation hardness level.
HSP Types

![HSP Types Diagram]

**FAMILY**
- SP: Signal Processing, DSP Function-Specific
- FAMILY
  - SP: Signal Processing
  - HSP: High-Speed Processing

**DEVICE TYPE**
- 43XXX: Digital Filters
- 45XXX: Signal Synthesis/Special Function
- 48XXX: Image Processing
- 95XX: Building Blocks
- 50XXX: Freq. Conversion and Modulation/ Demodulation

**TEMPERATURE RANGE**
- C: Commercial, 0°C to +70°C
- I: Industrial, -25°C to +85°C or -40°C to +85°C (Specified on Data Sheet)
- M: Military, -55°C to +125°C

**HIGH-RELIABILITY DESIGNATOR**
/883: -55°C to +125°C Fully Compliant to MIL-STD-883, Class B/QML

**SPEED GRADE IN MHz**

**PACKAGE DESIGNATOR**
- D: Die
- G: Ceramic Pin Grid Array (CPGA)
- J: Plastic Leaded Chip Carrier (PLCC)
- P: Dual-In-Line Plastic (PDIP)
- S: Small Outline Plastic (SOIC)
- V: Metric Quad Flatpack (MQFP)
- W: Wafer

**HIGH-RELIABILITY DESIGNATOR**
/883: -55°C to +125°C Fully Compliant to MIL-STD-883, Class B/QML

**PB-FREE OPTION**
- Z: Pb-Free Product
- ZA: Pb-Free with Anneal

ICL, ICM Types

![ICL, ICM Types Diagram]

**DEVICE FAMILY**
- ICL
- ICM

**PART NUMBER**
- **ICL 8069D C**

**TEMPERATURE RANGE**
- C: Commercial, 0°C to +70°C
- I: Industrial, -25°C to +85°C or -40°C to +85°C (Specified on Data Sheet)
- M: Military, -55°C to +125°C

**PACKAGE DESIGNATOR**
- B: Small Outline Plastic (SOIC)
- D: Ceramic Dual-In-Line Metal-Seal (SBDIP)
- F: Ceramic Flatpack
- H: Small Outline Transistor Plastic (SOT)
- J: Ceramic Dual-In-Line Frit-Seal (CERDIP)
- M: Metric Plastic Quad Flatpack (MQFP)
- P: Plastic Dual-In-Line
- S: TO-52 Can
- T: Can (TO-99, TO-100)
- Z: TO-92 (Plastic)
- /W: Wafer
- /D: Chip

**SUFFIX**
- /883B: Fully Compliant to MIL-STD-883 Class B/QML
- T: Tape and Reel

**PIN COUNT DESIGNATOR**

<table>
<thead>
<tr>
<th>SUFFIX</th>
<th>PIN COUNT</th>
<th>DIAMETER</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>8</td>
<td>0.200&quot; Pin Circle, Isolated Case</td>
</tr>
<tr>
<td>B</td>
<td>10</td>
<td>0.230&quot; Pin Circle, Isolated Case</td>
</tr>
<tr>
<td>C</td>
<td>12</td>
<td>0.230&quot; Pin Circle, Case to Pin 5</td>
</tr>
<tr>
<td>D</td>
<td>14</td>
<td>0.200&quot; Pin Circle, Case to Pin 4</td>
</tr>
<tr>
<td>E</td>
<td>16</td>
<td>0.230&quot; Pin Circle, Case to Pin 5</td>
</tr>
<tr>
<td>F</td>
<td>22</td>
<td>0.230&quot; Pin Circle, Case to Pin 5</td>
</tr>
<tr>
<td>G</td>
<td>24</td>
<td>0.230&quot; Pin Circle, Case to Pin 5</td>
</tr>
<tr>
<td>H</td>
<td>42</td>
<td>0.230&quot; Pin Circle, Case to Pin 5</td>
</tr>
<tr>
<td>I</td>
<td>28</td>
<td>0.230&quot; Pin Circle, Case to Pin 5</td>
</tr>
<tr>
<td>J</td>
<td>32</td>
<td>0.230&quot; Pin Circle, Case to Pin 5</td>
</tr>
<tr>
<td>K</td>
<td>35</td>
<td>0.230&quot; Pin Circle, Case to Pin 5</td>
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<tr>
<td>L</td>
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<td>P</td>
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<td>Q</td>
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<tr>
<td>R</td>
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<tr>
<td>V</td>
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<td>0.230&quot; Pin Circle, Isolated Case</td>
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<tr>
<td>X</td>
<td>10</td>
<td>0.230&quot; Pin Circle, Case to Pin 5</td>
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<tr>
<td>Y</td>
<td>8</td>
<td>0.200&quot; Pin Circle, Case to Pin 4</td>
</tr>
<tr>
<td>Z</td>
<td>8</td>
<td>0.230&quot; Pin Circle, Case to Pin 5</td>
</tr>
<tr>
<td>44</td>
<td>44</td>
<td>0.230&quot; Pin Circle, Case to Pin 5</td>
</tr>
</tbody>
</table>

Note: Suffix EV, EVAL: Evaluation Kit (Available for some products).
ICL Types (Interface Circuits)

- **DEVICE FAMILY**: ICL Interface
- **PART NUMBER**: E: 15kV ESD Protected

**PACKAGE DESIGNATOR**
- A: Shrink Small Outline (SSOP)
- B: 300 mil Small Outline Plastic (SOIC)
- BN: 150 mil Small Outline Plastic (SOIC)
- P: Plastic Dual-In-Line (PDIP)
- V: TSSOP
- Y: Die

**TEMPERATURE RANGE**
- C: Commercial (0°C to +70°C)
- I: Industrial (-40°C to +85°C)

**Tape and Reel**

JM JAN-QML Types

- **GENERAL SPECIFICATIONS**
- **DEVICE FAMILY**
- **SPECIFIC DEVICE**

**PACKAGE DESIGNATOR**
- See Specific Data Sheets

**DEVICE CLASS**
- B: Class B/QML

**LEAD FINISH**
- A: Solder
- C: Gold
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