Texas Instruments
Space, Military and Enhanced Products
Nomenclature

Other helpful information:
ROHS Status for TI Hermetic Components
QML Class Q and V Flow and Lot Documents
Understanding quality levels for high reliability-rated components (Rev. A)
Example: 5962R1022102VSC

Drawing Number—5962-10221

Radiation Hardness Assured (RHA) Level Designator – R
-“” = non RHA, no radiation assurance
P = 30 krad
L = 50 krad
R = 100 krad
F = 300 krad

Device—01

Device Structure—V
M = Vendor self-certification to the requirements for MIL-STD-883 compliant
Q = Certification and qualification to the MIL-PRF-38535 (Class Q)
V = Space Grade Certification and qualification to the MIL-PRF-38535 (Class V)

Package—S
A = 14-pin Flatpack (1/4” x 1/4”)
B = 14-pin Flatpack (3/16” x 1/4”)
C = 14-pin DIP
D = 14-pin Flatpack
E = 16-pin DIP
F = 16-pin Flatpack
G = 8-pin Can
H = 10-pin Flatpack
I = 10-pin Flatpack
J = 24-pin DIP
K = 24-pin Flatpack
L = 24-pin DIP
M = 12-pin Can
P = 8-pin DIP
Q = 40-pin DIP
R = 20-pin DIP
S = 20-pin Flatpack
V = 18-pin DIP
W = 22-pin DIP
X = Other packages
Y = Other packages

Lead Finish—C
A = Solder Dip
C = Gold Plate
D = Paladium

SMD Number is the orderable part number for TI Heritage QMLV Space Products
Example: 5962R1022102VSC

For TI Heritage QMLQ grade products, and National Heritage Space products, SMD number is an Alternate Part Number (APN). This can be found on ti.com in a product folder → Order Now tab → DSCC#
TI – Ceramic/Metal Can Space Grade Products
(via National acquisition)

Example: LM124A\text{WGRLQMLV}

Package Designator – \text{WG}
\begin{align*}
\text{WG} &= \text{CFP gullwing (NAC/NBC)} \\
\text{W} &= \text{CFP (NAD/NBA/NBB)} \\
\text{J} &= \text{CDIP (J) or CDIP (NAB)} \\
\text{H} &= \text{TO-99 (LMC) or TO (NDT/NDV)} \\
\text{K} &= \text{TO-3 (K)} \\
\text{CC} &= \text{CCGA (NAA)} \\
\text{LG} &= \text{FVA} \\
\text{YH} &= \text{TO (NDU)}
\end{align*}

Radiation Hardness Assured (RHA) Level Designator – \text{R}
\begin{align*}
\text{R} &= 100 \text{ krad} \\
\text{L} &= 50 \text{ krad} \\
\text{F} &= 300 \text{ krad} \\
\text{"-"} &= \text{non RHA}
\end{align*}

Dose Rate for RHA testing – \text{L}
\begin{align*}
\text{L} &= \text{Low Dose Rate (LDR)} \\
\text{No ‘L’} &= \text{High Dose Rate (HDR)}
\end{align*}

Qualification Designator – \text{QMLV}
\begin{align*}
\text{QMLV} &= \text{Space Grade, MIL-PRF-38535 Class V} \\
\text{MSL} &= \text{Processed to space grade but not on an SMD} \\
\text{MPR or /EM} &= \text{Engineering Model for prototyping. See here for more information.}
\end{align*}

For National Heritage Space products, SMD number (5962) is an Alternate Part Number (APN). This can be found on ti.com in a product folder → Order Now tab → DSCC#. Customers can order with either SMD or Standard part number.
**Example:** JM38510/00104B

**Process Level—** JM38510/

**Device/Slash Sheet—** 00104

**Device Class—** B

<table>
<thead>
<tr>
<th>Package Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>14-pin Flatpack (1/4” x 1/4”)</td>
</tr>
<tr>
<td>B</td>
<td>14-pin Flatpack (3/16” x 1/4”)</td>
</tr>
<tr>
<td>C</td>
<td>14-pin DIP</td>
</tr>
<tr>
<td>D</td>
<td>14-pin Flatpack</td>
</tr>
<tr>
<td>E</td>
<td>16-pin DIP</td>
</tr>
<tr>
<td>F</td>
<td>16-pin Flatpack</td>
</tr>
<tr>
<td>G</td>
<td>8-pin Can</td>
</tr>
<tr>
<td>H</td>
<td>10-pin Flatpack</td>
</tr>
<tr>
<td>I</td>
<td>10-pin Flatpack</td>
</tr>
<tr>
<td>J</td>
<td>24-pin DIP</td>
</tr>
<tr>
<td>K</td>
<td>24-pin Flatpack</td>
</tr>
<tr>
<td>L</td>
<td>24-pin DIP (300 mil)</td>
</tr>
<tr>
<td>M</td>
<td>12-pin Can</td>
</tr>
<tr>
<td>P</td>
<td>8-pin DIP</td>
</tr>
<tr>
<td>Q</td>
<td>40-pin DIP</td>
</tr>
<tr>
<td>R</td>
<td>20-pin DIP</td>
</tr>
<tr>
<td>S</td>
<td>20-pin Flatpack</td>
</tr>
<tr>
<td>V</td>
<td>18-pin DIP</td>
</tr>
<tr>
<td>W</td>
<td>22-pin DIP</td>
</tr>
<tr>
<td>2</td>
<td>20-pad LCC</td>
</tr>
<tr>
<td>3</td>
<td>28-pad LCC</td>
</tr>
<tr>
<td>X</td>
<td>Other packages</td>
</tr>
<tr>
<td>Y</td>
<td>Other packages</td>
</tr>
</tbody>
</table>

**Lead Finish—** A

- A = Solder Dip
- C = Gold Plate
- D = Paladium
- X = Other packages
- Y = Other packages
TI - Enhanced Product (COTS enhanced plastic parts)

Example: **TLE2022AMJGBEP**

**Unique Device Designator**—**TLE2022A**
A or B in last position = Upgrade

**Temperature Range**—M
M = -55°C to 125°C
A / S = Defined per datasheet
C = 0°C to 70°C
I = -40°C to 85°C
L = -55°C to 110°C
Q = -40°C to 125°C
T = -40°C to 105°C
W = -55°C to 115°C

**Package Type / Pin Count**—**JG**
See ti.com → product folder → Order Now

**Process Level**—B
Blank = Standard Suffix, Commercial Processing
B = MIL-PRF-38535 (QML)

**Enhanced Product**—EP
Over 750 Enhanced Plastic products meeting AQEC GEIA-STD-0002-1 standard are available. The part numbers for those devices end in EP. Additional information on EP products can be found here: [Enhanced Products Guide](#).
TI - Military Power Management Products (via Unitrode acquisition)

Example: UC1825BJ883BEP

Prefix—TLE
UC = Linear Integrated Circuits
UCC = BiCMOS

Part Number—1825
First Digit “1” = Military Temperature Range*
First Digit “2” = Industrial Temperature Range*
First Digit “3” = Commercial Temperature Range*

Optional Grades—B
A or B = Improved Version

Package Designation—J
J, JE = Ceramic DIP (300 mil and 600 mil)
L, L20 = Ceramic Leadless Chip Carrier (CLCC)

Process Level—883B

Enhanced Product—EP
Over 750 Enhanced Plastic products meeting AQEC GEIA-STD-0002-1 standard are available. The part numbers for those devices end in EP. Additional information on EP products can be found here: Enhanced Products Guide.

* = Consult individual data sheets for specific temperature ranges on each part.
** = The “883B” designator was retained to be consistent with the original Unitrode naming convention.
TI - Military Digital Signal Processors (DSPs)

Example: SMJ320C40GBM40EP

Prefix — SMJ
SM = Commercial Processing
SMJ = MIL-PRF-38535 (QML Class Q)
SMQ = MIL-PRF-38535 (QML Class N) (Order by SMD)
SMP = Production Prototype
SMX = Military Preproduction
TMS = Commercial Qualified
TMP = Commercial Grade
SMV = MIL-PRF-38535 QML Class V (Order by SMD)

320 DSP Family Designator — 320 or 32

320 DSP Product Designator — C40
BC = CMOS Boot
C = CMOS
E = CMOS EPROM
F = CMOS FLASH
LC = CMOS 3.3 V
VC = CMOS 1.5 V / 3.3 V
14 = E14 50 = C50 5409 = VC5409
15 = C15 62 = C62xx 5421 = VC5421
25 = C25 64 = C64xx
26 = C26 67 = C67xx
30 = C30 80 = C80
31 = C31 240 = F240
32 = C32 2812 = F2812
33 = VC33 5416 = VC5416
40 = C40 549 = LC549

Package Type / Pin Count — GB
JD = CDIP
FD/FJ = LCCC
GB/GF = CPGA
GFA = CFGP
GLG/GLP = FC/CSP
HFF/HFG = CFP
HFJ = CFP
KGD = KGD
PCM/PQ = QFP
GNM = FBGA
GAD = FCµBGA
GJC = FC/CSP
GJJ = FC/CSP
GLZ = FCBGA
GDP = LQFP
PGE = Plastic LQFP
GGU = BGA
GGW = BGA Microstar
PGF = LQFP
GHH = PBGA

Speed Designator — 40
12 = 120 MHz
16 = 160 MIPS (VC5416)
20 = 200 MIPS (VC5421)
33 = 33 MHz
40 = 40 MHz
50 = 500 MHz (C64xx)
60 = 60 MHz (600 MHz C6415)
60 = 60 MIPS (C54x)
66 = 66 MHz
10 = 100 MIPS (C54x)
14 = 140 MHz
15 = 150 MHz
16 = 167 MHz
17 = 175 MHz
20 = 200 MHz
120 = 120 MFLOPS (VC33)
150 = 150 MFLOPS (VC33)

Enhanced Product — EP
Over 750 Enhanced Plastic products meeting AQEC GEIA-STD-0002-1 standard are available. The part numbers for those devices end in EP. Additional information on EP products can be found here: Enhanced Products Guide.

* = Not all speed, package, process, temperature combinations are available.
TI – Ceramic Logic

Example: SNJ54ABTH162245WDEP

Prefix—SNJ
SNJ = MIL-PRF-38535 (QML)
SN = Commercial Processing
SNV = MIL-PRF-38535 QML Class V (Order by SMD)

Type—54

Technology—ABT
No designator = TTL
ALS/AS = Advanced Low-Power Schottky Advanced Schottky
AHC/AHCT = Advanced High SpeedCMOS
HC/HCT = High Speed CMOS
BCT = BiCMOS
AC/ACT = Advanced CMOS
ABT = Advanced BiCMOS
LVC = Low Voltage CMOS
LVTH = Low Voltage AdvancedCMOS w/ Bus Hold
CDC = Clock Distribution Circuit
CBT = Crossbar Bus Switch
GTL = Gunning Transceiver Logic
FCT = Fast CMOS Technology
F = FAST

Special Features—H
D = Level Shifting Diode (CBTD)
H = Bus Hold (LVTH)

Bus/Scan Options—16
8 = SCOPE/JTAG
16 = Widebus
18 = SCOPE/JTAG Widebus
32 = Widebus+

Options—2
2 = Series-Damping Resistors on Outputs

Device Function—245

Package Type—WD
PZ = LQFP
PW = TSSOP
DW = SOIC
DL = SSOP
D = SOIC
DB = TSSOP
DGG = TSSOP
DCK = SOP
GQL = BGA Microstar Junior
ZQL = BGA Microstar Junior
JJT = CDIP
W/WD = Ceramic Flatpack
FK = Leadless Ceramic Chip Carrier
HV, HT, HFP = Ceramic Quad Flatpack
GB = Pin Grid Array (PGA)

Enhanced Product—EP
Over 750 Enhanced Plastic products meeting AQEC GEIA-STD-0002-1 standard are available. The part numbers for those devices end in EP. Additional information on EP products can be found here: Enhanced Products Guide
TI – Ceramic/Metal Can Logic (via Harris acquisition)

Example: CD4XXXXXXXX

Prefix—CD
Device Function (up to 5 digits)—4XXXX

Supply Voltage—XX
A = 2 V Max
B = 18 V Max
UB = 18 V Max Unbuffered

Package Designation—X
F = Ceramic Dual In-Line Package (CDIP)
K = Ceramic Flatpack
D = Metal Seal CDIP

Process Levels—X
3 = Mil Temp Commercial Processing
3A = MIL-PRF-38535 (QML)
B = MIL-M-38510 Electrical (QPL)

TI – FIFOs (First-In, First-Out Products)

Example: SN54ABT36148HFPEP

Prefix—SN
SN = Commercial Processing
SNJ = MIL-PRF-38535 (QML) (Class Q)

Military Temperature—54
54 = -55°C to 125°C
74 = 0°C to 70°C

Technology—ABT
ABT = Advanced BiMOS
ACT = Advanced CMOS
LS = Low-Power Schottky
HC = High Speed CMOS (CMOS Input Levels)
HCT = High Speed CMOS (TTL Input Levels)

Circuit Designator—3614
J, JE = Ceramic DIP (300 mil and 600 mil)
L, L20 = Ceramic Leadless Chip Carrier (CLCC)

Package Type—HFP
J = CDIP
HFP = CFP
KGD = KGD
PCB/PN = QFP
FK = LCCC
GB = BGA Microstar

Enhanced Product—EP
Over 750 Enhanced Plastic products meeting AQEC GEIA-STD-0002-1 standard are available. The part numbers for those devices end in EP. Additional information on EP products can be found here: Enhanced Products Guide
TI - Ceramic Programmable Logic

Example: TIBPAL16L8-10MJB

Prefix—TIB
TIB = IMPACT™
Product Family Designator—PAL

Number of Array Inputs—16

Output Configuration Designator—L
L = Active Low
R = Registered
V = Variable (programmable)

Number of Outputs in Designated Configuration—8

Performance Designator—10
-7 = 7 ns propagation delay
-10 = 10 ns propagation delay
-12 = 12 ns propagation delay
-15 = 15 ns propagation delay
-20 = 20 ns propagation delay
-25 = 25 ns propagation delay
-30 = 30 ns propagation delay
A = Standard power
A-2 = Half power

Temperature Range—M
M = -55°C to 125°C

Package Type—J
J,JT = Ceramic Dual In-Line Package (CDIP)
FK = Leadless Ceramic Chip Carrier (LCCC)
W = Ceramic Flatpack (CFP)

Processing—B
Blank = Commercial processing
B = MIL-PRF-38535 (QML) (Class Q)
For more information

www.ti.com/hirel
IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to TI's Terms of Sale (www.ti.com/legal/termsofsale.html) or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2019, Texas Instruments Incorporated