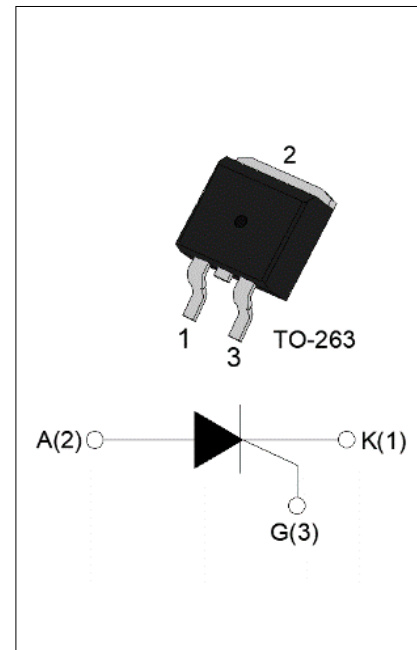


**DESCRIPTION:**

With high ability to withstand the shock loading of large current, JCT616EH SCR provides high  $dV/dt$  rate with strong resistance to electromagnetic interference. It is especially recommended for use on solid state relay, motorcycle, power charger, T-tools etc. Package TO-263 is RoHS compliant.

**MAIN FEATURES**

| Symbol            | Value     | Unit |
|-------------------|-----------|------|
| $I_{T(RMS)}$      | 16        | A    |
| $V_{DRM}/V_{RRM}$ | 600       | V    |
| $I_{GT}$          | $\leq 15$ | mA   |

**ABSOLUTE MAXIMUM RATINGS**

| Parameter                                                                                            | Symbol       | Value   | Unit        |
|------------------------------------------------------------------------------------------------------|--------------|---------|-------------|
| Storage junction temperature range                                                                   | $T_{stg}$    | -40-150 | $^{\circ}C$ |
| Operating junction temperature range                                                                 | $T_j$        | -40-150 | $^{\circ}C$ |
| Repetitive peak off-state voltage ( $T_j=25^{\circ}C$ )                                              | $V_{DRM}$    | 600     | V           |
| Repetitive peak reverse voltage ( $T_j=25^{\circ}C$ )                                                | $V_{RRM}$    | 600     | V           |
| Average on-state current ( $T_c \leq 121^{\circ}C$ )                                                 | $I_{T(AV)}$  | 10      | A           |
| RMS on-state current ( $T_c \leq 121^{\circ}C$ )                                                     | $I_{T(RMS)}$ | 16      | A           |
| Non repetitive surge peak on-state current ( $t_p=10ms$ , $T_j=25^{\circ}C$ )                        | $I_{TSM}$    | 150     | A           |
| Non repetitive surge peak on-state current ( $t_p=8.3ms$ , $T_j=25^{\circ}C$ )                       |              | 165     |             |
| $I^2t$ value for fusing ( $t_p=10ms$ , $T_j=25^{\circ}C$ )                                           | $I^2t$       | 113     | $A^2s$      |
| Critical rate of rise of on-state current ( $I_G=2 \times I_{GT}$ , $f=100Hz$ , $T_j=150^{\circ}C$ ) | $di/dt$      | 150     | $A/\mu s$   |
| Peak gate current ( $t_p=20\mu s$ , $T_j=150^{\circ}C$ )                                             | $I_{GM}$     | 5       | A           |
| Average gate power dissipation ( $T_j=150^{\circ}C$ )                                                | $P_{G(AV)}$  | 1       | W           |

|                                                                                      |          |     |    |
|--------------------------------------------------------------------------------------|----------|-----|----|
| Peak gate power                                                                      | $P_{GM}$ | 20  | W  |
| Peak pulse voltage<br>( $T_j=25^{\circ}\text{C}$ ; non-repetitive, off-state; FIG.8) | $V_{pp}$ | 0.5 | kV |

**ELECTRICAL CHARACTERISTICS** ( $T_j=25^{\circ}\text{C}$  unless otherwise specified)

| Symbol    | Test Condition                                                                     | Value |      |      | Unit             |
|-----------|------------------------------------------------------------------------------------|-------|------|------|------------------|
|           |                                                                                    | MIN.  | TYP. | MAX. |                  |
| $I_{GT}$  | $V_D=12\text{V}$ $R_L=33\Omega$                                                    | -     | -    | 15   | mA               |
| $V_{GT}$  |                                                                                    | -     | -    | 1    | V                |
| $V_{GD}$  | $V_D=V_{DRM}$ $T_j=150^{\circ}\text{C}$ $R_L=3.3\text{k}\Omega$                    | 0.2   | -    | -    | V                |
| $I_L$     | $I_G=1.2I_{GT}$                                                                    | -     | -    | 60   | mA               |
| $I_H$     | $I_T=500\text{mA}$                                                                 | -     | -    | 50   | mA               |
| dV/dt     | $V_D=400\text{V}$ Gate Open $T_j=125^{\circ}\text{C}$                              | 1000  | -    | -    | V/ $\mu\text{s}$ |
|           | $V_D=400\text{V}$ Gate Open $T_j=150^{\circ}\text{C}$                              | 500   | -    | -    |                  |
| $t_{on}$  | $I_G=40\text{mA}$ $I_A=400\text{mA}$ $I_R=40\text{mA}$<br>$T_j=25^{\circ}\text{C}$ | -     | 2    | -    | $\mu\text{s}$    |
| $t_{off}$ |                                                                                    | -     | 60   | -    |                  |

**STATIC CHARACTERISTICS**

| Symbol    | Parameter                                |                           | Value(MAX.) | Unit             |
|-----------|------------------------------------------|---------------------------|-------------|------------------|
| $V_{TM}$  | $I_{TM}=32\text{A}$ $t_p=380\mu\text{s}$ | $T_j=25^{\circ}\text{C}$  | 1.55        | V                |
| $V_{TO}$  | Threshold voltage                        | $T_j=150^{\circ}\text{C}$ | 0.74        | V                |
| $R_D$     | Dynamic resistance                       | $T_j=150^{\circ}\text{C}$ | 25          | $\text{m}\Omega$ |
| $I_{DRM}$ | $V_D=V_{DRM}$ $V_R=V_{RRM}$              | $T_j=25^{\circ}\text{C}$  | 5           | $\mu\text{A}$    |
| $I_{RRM}$ |                                          | $T_j=150^{\circ}\text{C}$ | 2           | mA               |

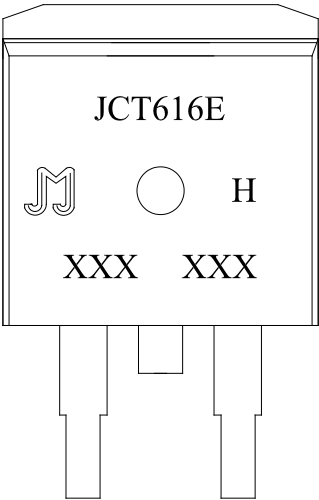
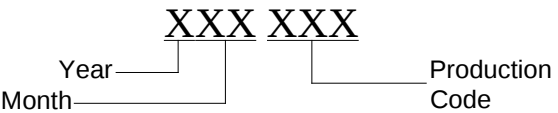
**THERMAL RESISTANCES**

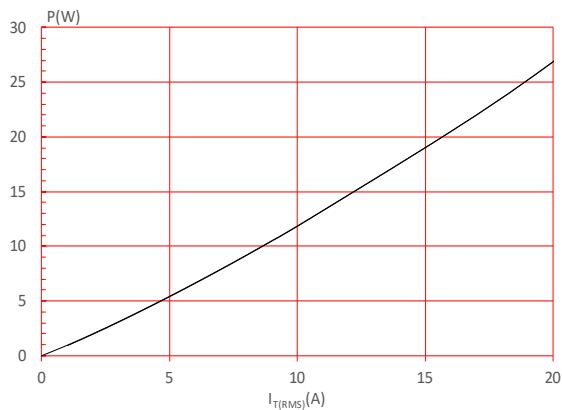
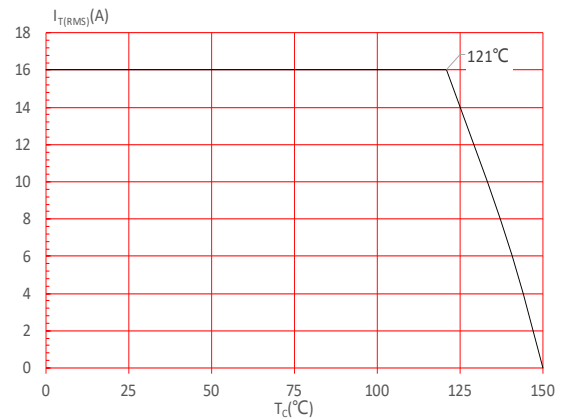
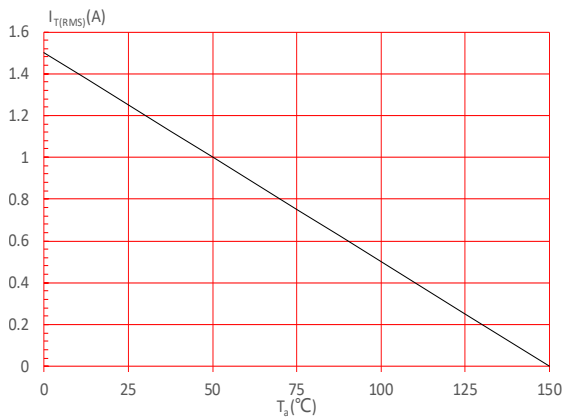
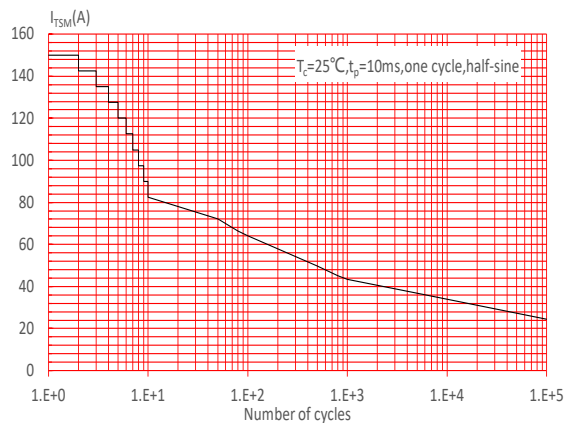
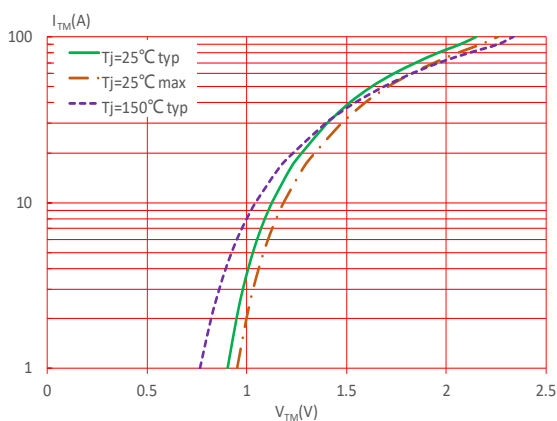
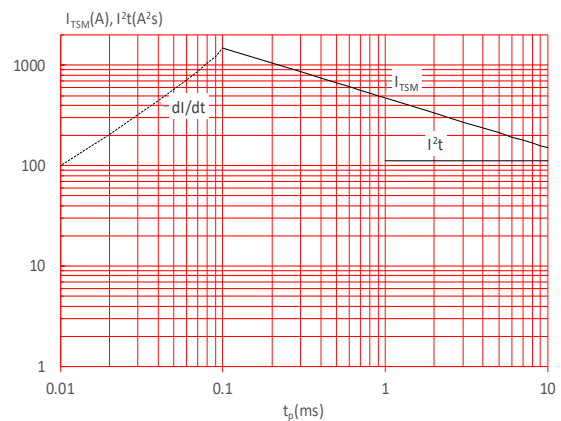
| Symbol        | Parameter                                                | Value | Unit                        |
|---------------|----------------------------------------------------------|-------|-----------------------------|
| $R_{th(j-c)}$ | junction to case (DC)                                    | 1.4   | $^{\circ}\text{C}/\text{W}$ |
| $R_{th(j-a)}$ | junction to ambient (DC, in free air, $S=1\text{cm}^2$ ) | 55    | $^{\circ}\text{C}/\text{W}$ |

## ORDERING INFORMATION

|                                   |                                            |   |                          |          |                           |                               |
|-----------------------------------|--------------------------------------------|---|--------------------------|----------|---------------------------|-------------------------------|
| J                                 | CT                                         | 6 | 16                       | E        | H                         | -/                            |
| JieJie Microelectronics Co., Ltd. | SCRs                                       |   |                          |          |                           | Blank:Tube<br>-TR:Tape & Reel |
|                                   | 6:V <sub>DRM</sub> /V <sub>RRM</sub> ≥600V |   | I <sub>T(RMS)</sub> :16A | E:TO-263 | High junction temperature |                               |

## MARKING

|                                                                                     |                                                                                      |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  |  |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|

**FIG.1:** Maximum power dissipation versus RMS on-state current

**FIG.2:** RMS on-state current versus case temperature

**FIG.3:** RMS on-state current versus ambient temperature (printed circuit board FR4,copper thickness:35μm)(full cycle)

**FIG.4:** Surge peak on-state current versus number of cycles

**FIG.5:** On-state characteristics

**FIG.6:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10ms$ , and corresponding value of  $I^2t$  ( $dI/dt < 150A/\mu s$ )


**FIG.7:** Relative variations of gate trigger current, holding current and latching current versus junction temperature

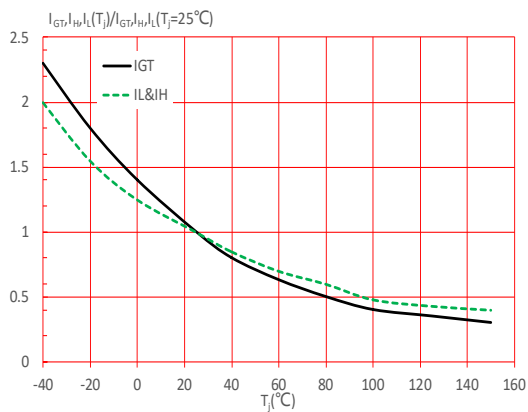
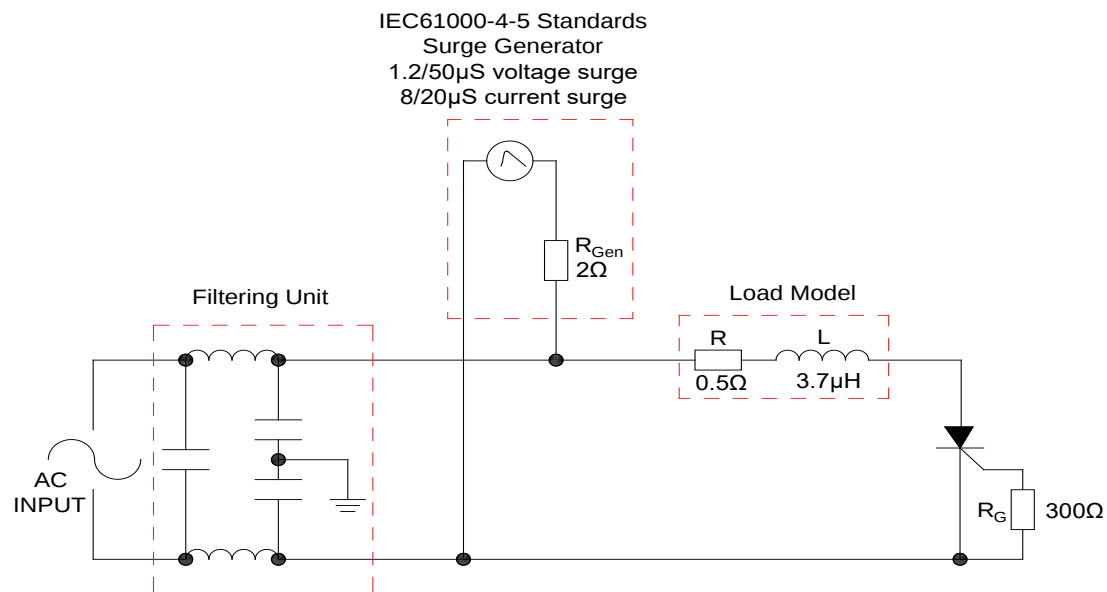
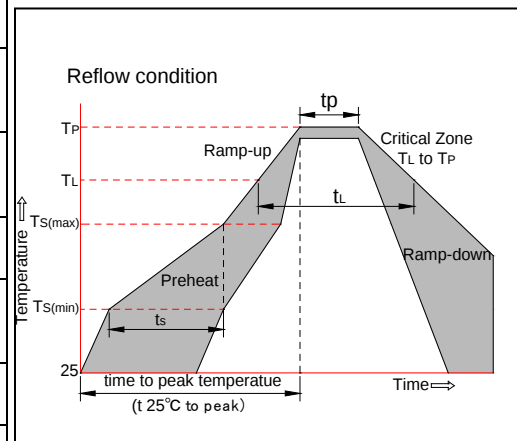


FIG.8: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards.



## SOLDERING PARAMETERS

| Reflow Condition                                                  |                                             | Pb-Free assembly<br>(see figure at right) |
|-------------------------------------------------------------------|---------------------------------------------|-------------------------------------------|
| Pre Heat                                                          | -Temperature Min<br>(T <sub>S(min)</sub> )  | +150°C                                    |
|                                                                   | -Temperature<br>Max(T <sub>S(max)</sub> )   | +200°C                                    |
|                                                                   | -Time (Min to Max)<br>(t <sub>s</sub> )     | 60-180 secs.                              |
| Average ramp up rate<br>(Liquidus Temp (T <sub>L</sub> ) to peak) |                                             | 3°C/sec. Max                              |
| T <sub>S(max)</sub> to T <sub>L</sub> - Ramp-up Rate              |                                             | 3°C/sec. Max                              |
| Reflow                                                            | -Temperature(T <sub>L</sub> )<br>(Liquidus) | +217°C                                    |
|                                                                   | -Temperature(t <sub>L</sub> )               | 60-150 secs.                              |
| Peak Temp (T <sub>p</sub> )                                       |                                             | +260(+0/-5)°C                             |
| Time within 5°C of actual<br>Peak Temp (t <sub>p</sub> )          |                                             | 20-40secs.                                |
| Ramp-down Rate                                                    |                                             | 6°C/sec. Max                              |
| Time 25°C to Peak Temp (T <sub>p</sub> )                          |                                             | 8 min. Max                                |
| Do not exceed                                                     |                                             | +260°C                                    |



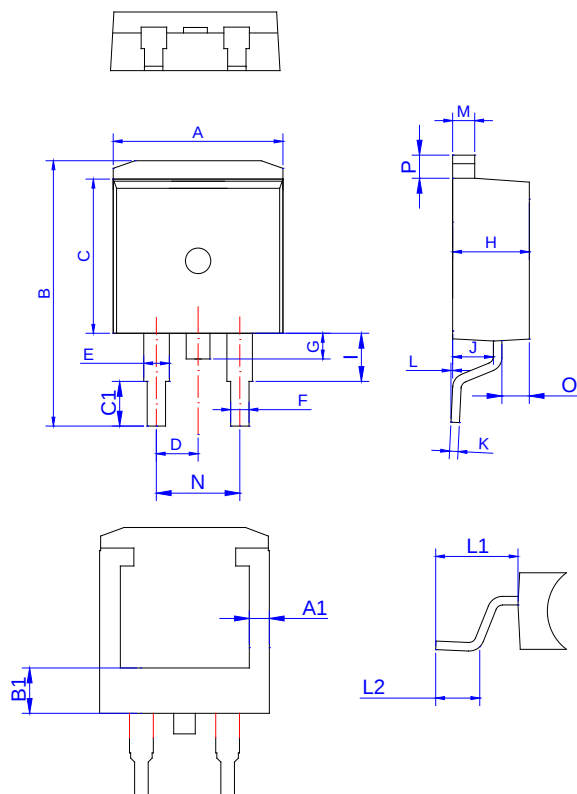
**ORDERING INFORMATION**

| Order code  | Voltage<br>$V_{\text{DRM}}/V_{\text{RRM}}$ (V) | IGT(mA) | Package | Base qty.<br>(pcs) | Delivery<br>mode |
|-------------|------------------------------------------------|---------|---------|--------------------|------------------|
| JCT616EH    | 600                                            | 15      | TO-263  | 50                 | Tube             |
| JCT616EH-TR |                                                |         |         | 800                | Tape & Reel      |

**Document Revision History**

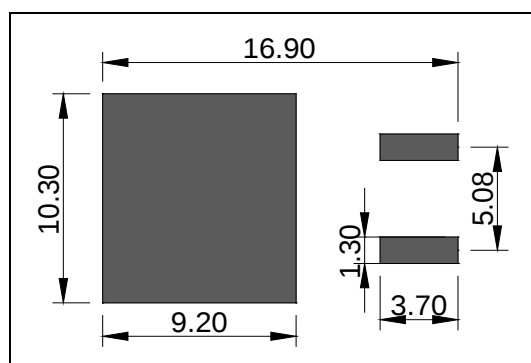
| Date         | Revision | Changes                        |
|--------------|----------|--------------------------------|
| Jun.15, 2023 | A.1.0    | Last update                    |
| Oct.16, 2025 | A.1.1    | Revise PACKAGE MECHANICAL DATA |

## PACKAGE MECHANICAL DATA



| Ref. | Dimensions  |      |       |        |       |       |
|------|-------------|------|-------|--------|-------|-------|
|      | Millimeters |      |       | Inches |       |       |
|      | Min.        | Typ. | Max.  | Min.   | Typ.  | Max.  |
| A    | 9.90        |      | 10.20 | 0.390  |       | 0.402 |
| A1   | 0.80        |      | 1.20  | 0.031  |       | 0.047 |
| B    | 14.70       |      | 15.80 | 0.579  |       | 0.622 |
| B1   | 2.15        |      | 2.55  | 0.085  |       | 0.100 |
| C    | 9.40        |      | 9.60  | 0.370  |       | 0.378 |
| C1   | 2.40        |      | 2.80  | 0.094  |       | 0.110 |
| D    | 2.40        |      | 2.70  | 0.094  |       | 0.106 |
| E    | 1.20        |      | 1.50  | 0.047  |       | 0.059 |
| F    | 0.75        |      | 0.85  | 0.029  |       | 0.033 |
| G    | 1.00        |      | 1.50  | 0.039  |       | 0.059 |
| H    | 4.40        |      | 4.70  | 0.173  |       | 0.185 |
| I    | 1.80        |      | 2.20  |        |       |       |
| J    | 2.30        |      | 2.70  | 0.091  |       | 0.106 |
| K    | 0.38        |      | 0.55  | 0.015  |       | 0.022 |
| L    | 0           | 0.10 | 0.25  | 0      | 0.004 | 0.010 |
| L1   | 4.65        |      | 5.05  | 0.183  |       | 0.199 |
| L2   | 1.90        |      |       | 0.075  |       |       |
| M    | 1.25        |      | 1.35  | 0.049  |       | 0.053 |
| N    | 4.80        |      | 5.20  |        |       |       |
| O    | 1.30        |      | 1.50  |        |       |       |
| P    | 1.20        |      | 1.50  | 0.047  |       | 0.059 |

## FOOTPRINT-TO-263 (dimensions in mm)



Technical drawing of a mechanical part, showing front and side views with dimensions.

**Front View Dimensions:**

- Overall width:  $530 \pm 0.5$
- Distance from left edge to center of hole: 518
- Distance from right edge to center of hole: 12.9
- Hole diameter:  $\varnothing 3.0$
- Surface finish symbol:  $\sqrt{0.05}$

**Side View Dimensions:**

- Overall height:  $7 - 0.2^0$
- Distance from top edge to center of hole: 1.5
- Distance from bottom edge to center of hole: 1.5
- Distance from left edge to center of hole: 10.8
- Distance from right edge to center of hole: 2.6
- Distance from top edge to bottom edge: 17.9

[illegible]

| Ref. | Dimensions  |       |       |        |       |       |
|------|-------------|-------|-------|--------|-------|-------|
|      | Millimeters |       |       | Inches |       |       |
|      | Min.        | Typ.  | Max.  | Min.   | Typ.  | Max.  |
| W    | 23.70       | 24.00 | 24.30 | 0.933  | 0.945 | 0.957 |
| E    | 1.65        | 1.75  | 1.85  | 0.065  | 0.069 | 0.073 |
| F    | 11.40       | 11.50 | 11.60 | 0.449  | 0.453 | 0.457 |
| D0   | -           | 1.50  | 1.60  | -      | 0.059 | 0.063 |
| D1   | -           | 1.50  | 1.60  | -      | 0.059 | 0.063 |
| P0   | 3.90        | 4.00  | 4.10  | 0.154  | 0.157 | 0.161 |
| P1   | 15.90       | 16.00 | 16.10 | 0.626  | 0.630 | 0.634 |
| P2   | 1.90        | 2.00  | 2.10  | 0.075  | 0.079 | 0.083 |
| A0   | 10.80       | 10.90 | 11.00 | 0.425  | 0.429 | 0.433 |
| B0   | 16.20       | 16.30 | 16.40 | 0.638  | 0.642 | 0.646 |
| K0   | 4.80        | 4.90  | 5.00  | 0.189  | 0.193 | 0.197 |
| t    | 0.35        | 0.40  | 0.45  | 0.014  | 0.016 | 0.018 |

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