



## Description

### JMT Dual N-channel Enhancement Mode Power MOSFET

#### Features

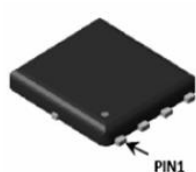
- 40V, 55A  
 $R_{DS(ON)} < 7.8 \text{ m}\Omega @ V_{GS} = 10\text{V}$   
 $R_{DS(ON)} < 10.4 \text{ m}\Omega @ V_{GS} = 4.5\text{V}$
- Advanced Trench Technology
- Provide Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead Free

#### Application

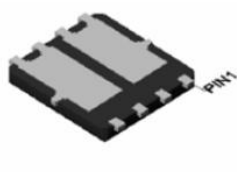
- Load Switch
- PWM Application
- Power Management



*100% UIS TESTED!*  
*100%  $\Delta V_{ds}$  TESTED!*

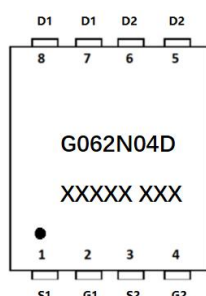


Top View

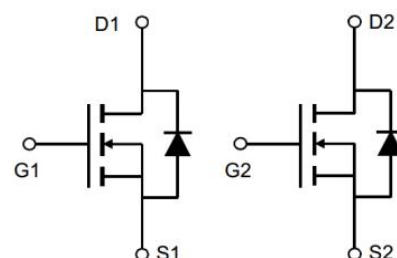


Bottom View

PDFN5x6-8L-D



Marking and pin Assignment



Schematic Diagram

## Package Marking and Ordering Information

| Device Marking | Device      | Outline | Package      | Reel Size | Reel (pcs) | Per Carton (pcs) |
|----------------|-------------|---------|--------------|-----------|------------|------------------|
| G062N04D       | JMTG062N04D | TAPING  | PDFN5x6-8L-D | 13"       | 2500       | 25000            |

## Absolute Maximum Ratings ( $T_C=25^\circ\text{C}$ unless otherwise specified)

| Symbol                            | Parameter                                       |                        | Max.        | Units |
|-----------------------------------|-------------------------------------------------|------------------------|-------------|-------|
| V <sub>DSS</sub>                  | Drain-Source Voltage                            |                        | 40          | V     |
| V <sub>GSS</sub>                  | Gate-Source Voltage                             |                        | ±20         | V     |
| I <sub>D</sub>                    | Continuous Drain Current                        | T <sub>C</sub> = 25°C  | 55          | A     |
|                                   |                                                 | T <sub>C</sub> = 100°C | 36          | A     |
| I <sub>DM</sub>                   | Pulsed Drain Current <sup>note1</sup>           |                        | 220         | A     |
| E <sub>AS</sub>                   | Single Pulsed Avalanche Energy <sup>note2</sup> |                        | 100         | mJ    |
| P <sub>D</sub>                    | Power Dissipation                               | T <sub>C</sub> = 25°C  | 34          | W     |
| R <sub>θJC</sub>                  | Thermal Resistance, Junction to Case            |                        | 3.7         | °C/W  |
| T <sub>J</sub> , T <sub>STG</sub> | Operating and Storage Temperature Range         |                        | -55 to +150 | °C    |



## Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

| Symbol                                                 | Parameter                                                 | Test Condition                                                                         | Min. | Typ. | Max. | Units |
|--------------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------|------|------|------|-------|
| Off Characteristics                                    |                                                           |                                                                                        |      |      |      |       |
| V <sub>(BR)DSS</sub>                                   | Drain-Source Breakdown Voltage                            | V <sub>GS</sub> =0V,I <sub>D</sub> =250μA                                              | 40   | -    | -    | V     |
| I <sub>DSS</sub>                                       | Zero Gate Voltage Drain Current                           | V <sub>DS</sub> =40V, V <sub>GS</sub> = 0V,                                            | -    | -    | 1.0  | μA    |
| I <sub>GSS</sub>                                       | Gate to Body Leakage Current                              | V <sub>DS</sub> =0V,V <sub>GS</sub> = ±20V                                             | -    | -    | ±100 | nA    |
| On Characteristics                                     |                                                           |                                                                                        |      |      |      |       |
| V <sub>GS(th)</sub>                                    | Gate Threshold Voltage                                    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA                              | 1.0  | 1.6  | 2.5  | V     |
| R <sub>DS(on)</sub>                                    | Static Drain-Source on-Resistance<br><small>note3</small> | V <sub>GS</sub> =10V, I <sub>D</sub> =30A                                              | -    | 6.2  | 7.8  | mΩ    |
|                                                        |                                                           | V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A                                             | -    | 8.0  | 10.4 |       |
| Dynamic Characteristics                                |                                                           |                                                                                        |      |      |      |       |
| C <sub>iss</sub>                                       | Input Capacitance                                         | V <sub>DS</sub> = 20V, V <sub>GS</sub> =0V,<br>f = 1.0MHz                              | -    | 2852 | -    | pF    |
| C <sub>oss</sub>                                       | Output Capacitance                                        |                                                                                        | -    | 422  | -    | pF    |
| C <sub>rss</sub>                                       | Reverse Transfer Capacitance                              |                                                                                        | -    | 140  | -    | pF    |
| Q <sub>g</sub>                                         | Total Gate Charge                                         | V <sub>DD</sub> =20V, I <sub>D</sub> =20A,<br>V <sub>GS</sub> =10V                     | -    | 55   | -    | nC    |
| Q <sub>gs</sub>                                        | Gate-Source Charge                                        |                                                                                        | -    | 10   | -    | nC    |
| Q <sub>gd</sub>                                        | Gate-Drain(“Miller”) Charge                               |                                                                                        | -    | 11   | -    | nC    |
| Switching Characteristics                              |                                                           |                                                                                        |      |      |      |       |
| t <sub>d(on)</sub>                                     | Turn-on Delay Time                                        | V <sub>DD</sub> =20V,R <sub>L</sub> =1Ω,<br>R <sub>GEN</sub> =3Ω, V <sub>GS</sub> =10V | -    | 11   | -    | ns    |
| t <sub>r</sub>                                         | Turn-on Rise Time                                         |                                                                                        | -    | 84   | -    | ns    |
| t <sub>d(off)</sub>                                    | Turn-off Delay Time                                       |                                                                                        | -    | 61   | -    | ns    |
| t <sub>f</sub>                                         | Turn-off Fall Time                                        |                                                                                        | -    | 100  | -    | ns    |
| Drain-Source Diode Characteristics and Maximum Ratings |                                                           |                                                                                        |      |      |      |       |
| I <sub>S</sub>                                         | Maximum Continuous Drain to Source Diode Forward Current  |                                                                                        | -    | -    | 55   | A     |
| I <sub>SM</sub>                                        | Maximum Pulsed Drain to Source Diode Forward Current      |                                                                                        | -    | -    | 220  | A     |
| V <sub>SD</sub>                                        | Drain to Source Diode Forward Voltage                     | V <sub>GS</sub> =0V, I <sub>S</sub> =30A                                               | -    | -    | 1.2  | V     |
| t <sub>rr</sub>                                        | Body Diode Reverse Recovery Time                          | I <sub>F</sub> =20A,<br>dI/dt=100A/μs                                                  | -    | 24   | -    | ns    |
| Q <sub>rr</sub>                                        | Body Diode Reverse Recovery Charge                        |                                                                                        | -    | 17   | -    | nC    |

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

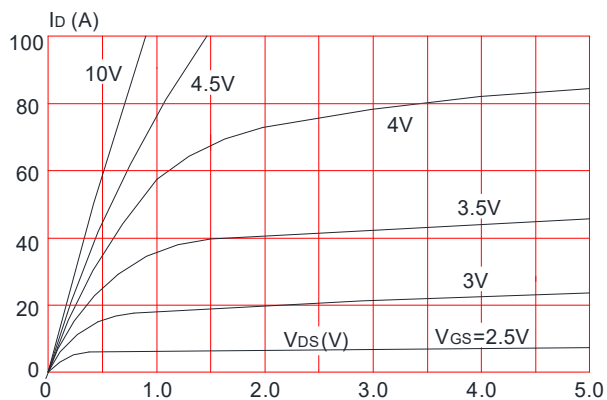
2. EAS condition: Starting T<sub>J</sub>=25°C, V<sub>DD</sub>=20V, V<sub>GS</sub>=10V, R<sub>G</sub>=25Ω, L=0.5mH, I<sub>AS</sub>=20A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

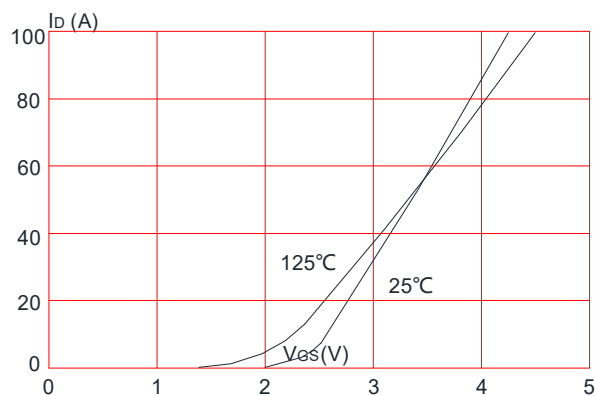


## Typical Performance Characteristics

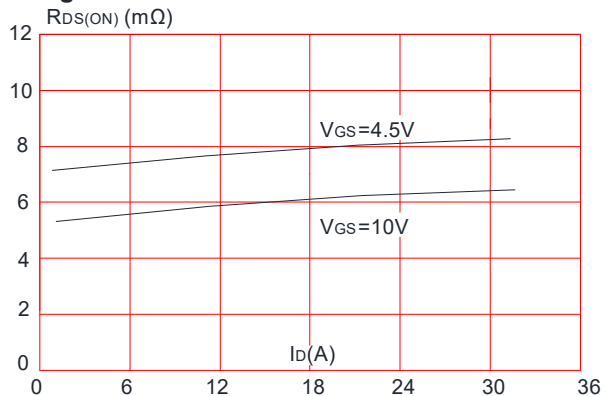
**Figure 1: Output Characteristics**



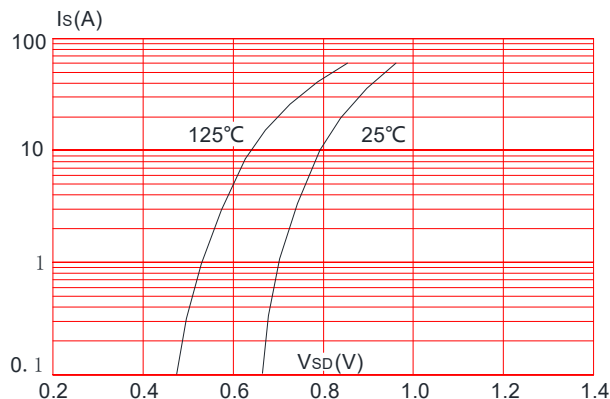
**Figure 2: Typical Transfer Characteristics**



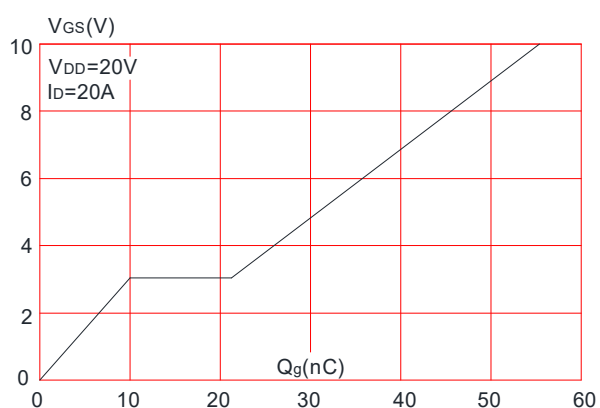
**Figure 3: On-resistance vs. Drain Current**



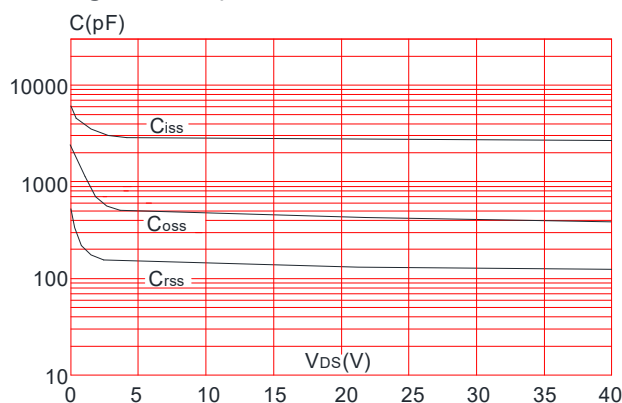
**Figure 4: Body Diode Characteristics**



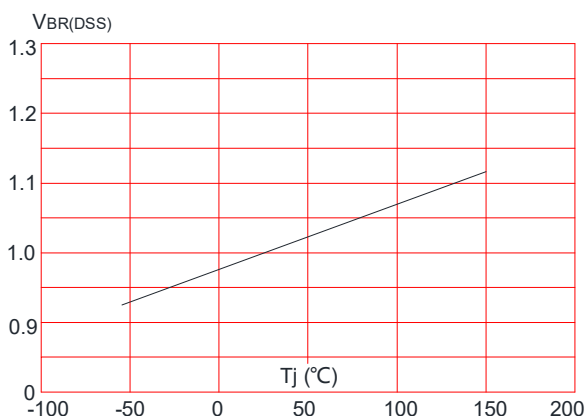
**Figure 5: Gate Charge Characteristics**



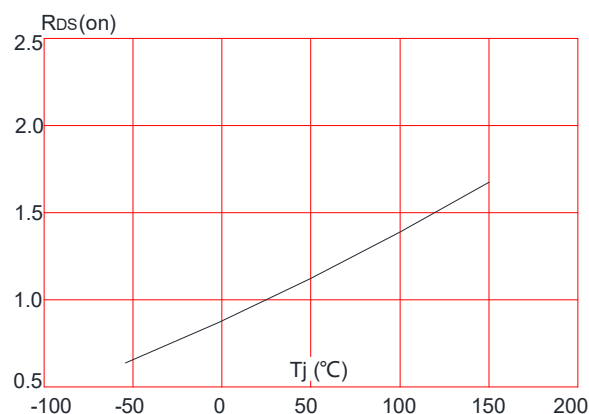
**Figure 6: Capacitance Characteristics**



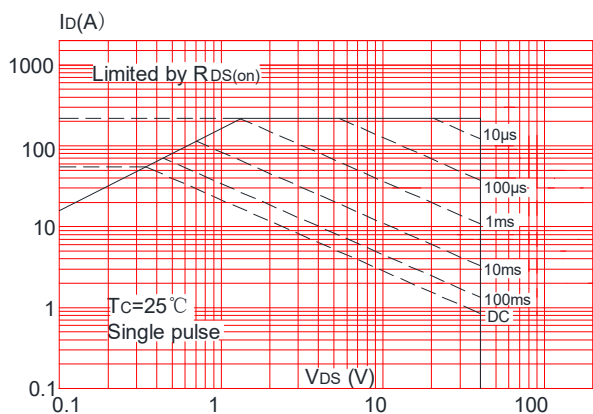
**Figure 7: Normalized Breakdown Voltage vs. Junction Temperature**



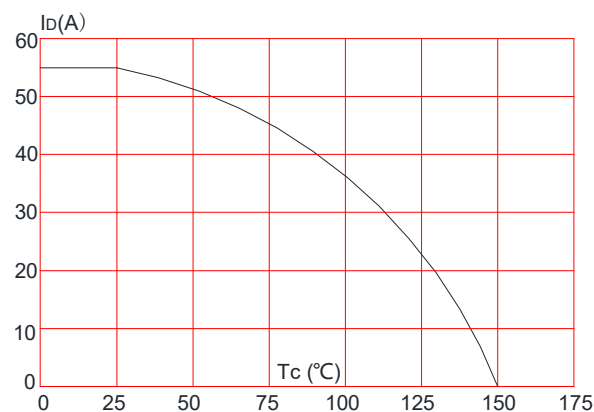
**Figure 8: Normalized on Resistance vs. Junction Temperature**



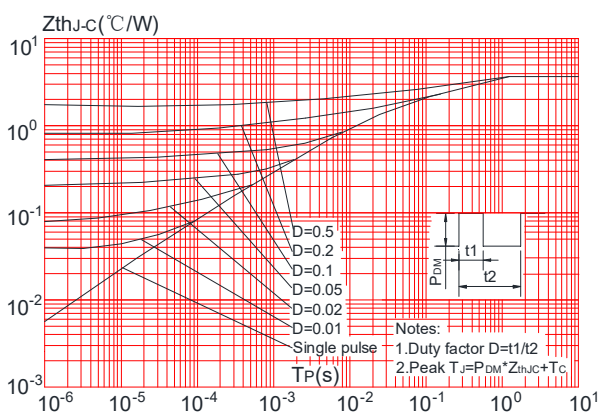
**Figure 9: Maximum Safe Operating Area**



**Figure 10: Maximum Continuous Drain Current vs. Case Temperature**



**Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Case**



## Test Circuit

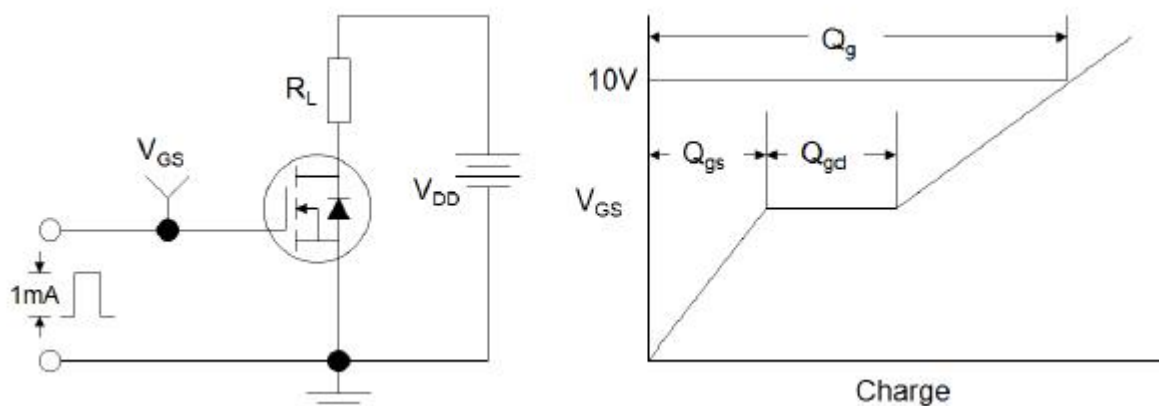


Figure1:Gate Charge Test Circuit & Waveform

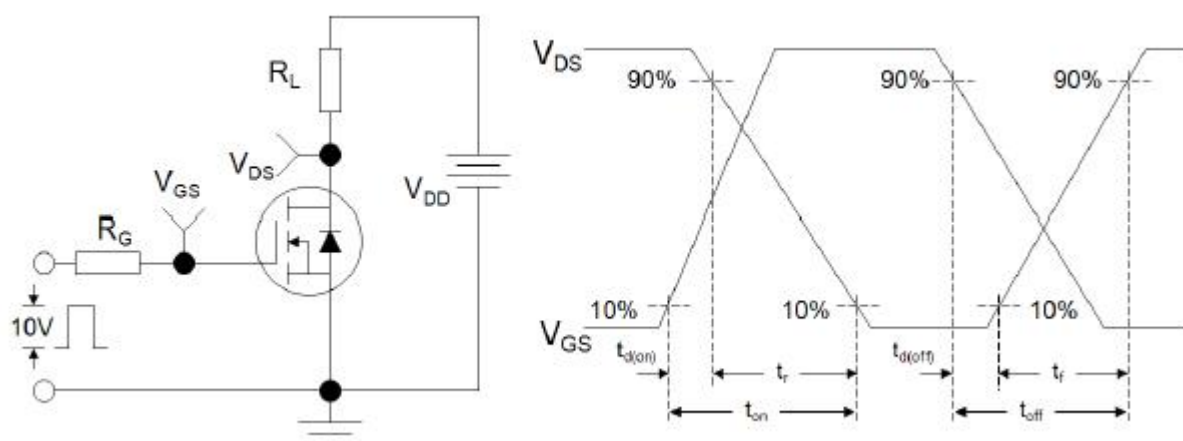


Figure 2: Resistive Switching Test Circuit & Waveforms

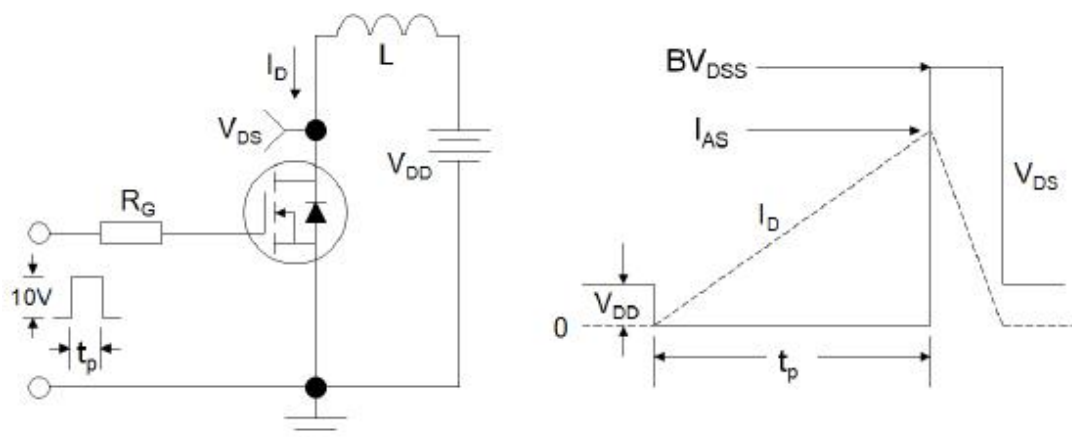
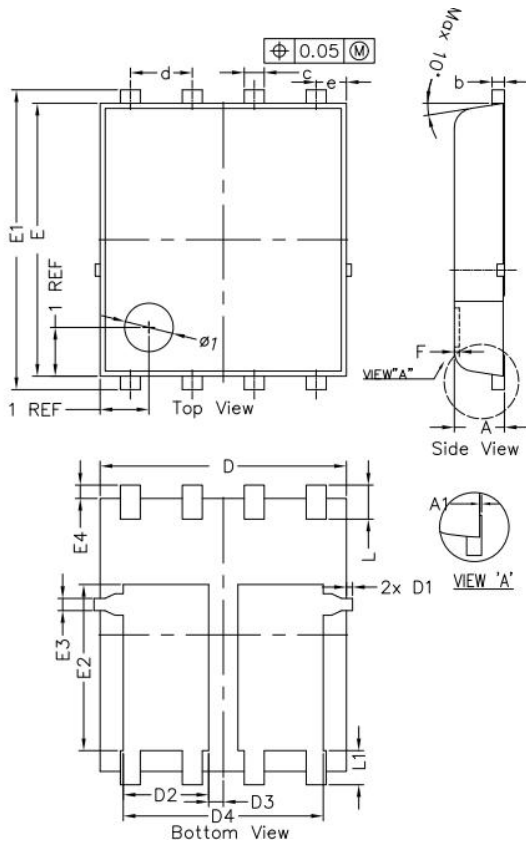


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



## Package Mechanical Data-PDFN5x6-8L-D



| SYMBOLS | DIMENSION IN MM |       |       | DIMENSION IN INCHES |       |       |
|---------|-----------------|-------|-------|---------------------|-------|-------|
|         | MIN             | NOM   | MAX   | MIN                 | NOM   | MAX   |
| * A     | 0.900           | 1.000 | 1.100 | 0.035               | 0.039 | 0.043 |
| A1      | 0.000           | ---   | 0.050 | 0.000               | ----  | 0.002 |
| b       | 0.246           | 0.254 | 0.312 | 0.010               | 0.010 | 0.012 |
| * c     | 0.310           | 0.410 | 0.510 | 0.012               | 0.016 | 0.020 |
| d       | 1.27 BSC        |       |       | 0.050 BSC           |       |       |
| * D     | 4.950           | 5.050 | 5.150 | 0.195               | 0.199 | 0.203 |
| *D1     | ---             | ---   | 0.125 | ---                 | ---   | 0.005 |
| *D2     | 1.650           | 1.750 | 1.850 | 0.065               | 0.069 | 0.073 |
| D3      | 0.200           | 0.300 | 0.400 | 0.008               | 0.012 | 0.016 |
| D4      | 4.000           | 4.100 | 4.200 | 0.157               | 0.161 | 0.165 |
| e       | 0.62 BSC        |       |       | 0.024 BSC           |       |       |
| * E     | 5.500           | 5.600 | 5.700 | 0.217               | 0.220 | 0.224 |
| * E1    | 6.050           | 6.150 | 6.250 | 0.238               | 0.242 | 0.246 |
| E2      | 3.310           | 3.410 | 3.510 | 0.130               | 0.134 | 0.138 |
| E3      | 0.150           | 0.250 | 0.350 | 0.006               | 0.010 | 0.014 |
| * E4    | 0.175           | 0.275 | 0.375 | 0.007               | 0.011 | 0.015 |
| F       | -               | -     | 0.100 | -                   | -     | 0.004 |
| * L     | 0.500           | 0.600 | 0.700 | 0.02                | 0.02  | 0.03  |
| L1      | 0.600           | 0.700 | 0.800 | 0.02                | 0.03  | 0.03  |

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