



Description

The AONS21321 uses advanced trench technology excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a load switch or in PWM applications.

General Features

$V_{DS} = -30V, I_D = -50A$

$R_{DS(ON)} < 15m\Omega @ V_{GS} = -10V$

$R_{DS(ON)} < 25m\Omega @ V_{GS} = -4.5V$

High Power and current handling capability

Lead free product is acquired

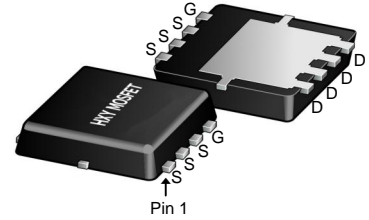
Surface mount package

Application

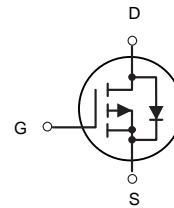
PWM applications

Load switch

Power management



DFN5X6-8L



P-Channel MOSFET

Package Marking and Ordering Information

| Product ID | Pack | Brand | Qty(PCS) |
|------------|-----------|------------|----------|
| AONS21321 | DFN5X6-8L | HXY MOSFET | 5000 |

Absolute Maximum Ratings ($T_A=25^\circ C$ unless otherwise noted)

| Symbol | Parameter | Limit | Unit |
|---------------|--|------------|--------------|
| VDS | Drain-Source Voltage | -30 | V |
| VGS | Gate-Source Voltage | ± 20 | V |
| I_D | Drain Current-Continuous ($T_C=25^\circ C$) | -50 | A |
| | Drain Current-Continuous ($T_C=100^\circ C$) | -24 | |
| IDM | Drain Current-Pulsed (Note 1) | -80 | A |
| P_D | Maximum Power Dissipation ($T_C=25^\circ C$) | 3 | W |
| | Maximum Power Dissipation ($T_C=100^\circ C$) | 1.3 | |
| EAS | Single pulse avalanche energy (Note 5) | 231 | mJ |
| TJ, TSTG | Operating Junction and Storage Temperature Range | -55 To 150 | $^\circ C$ |
| R θ JA | Thermal Resistance, Junction-to-Ambient (Note 2) | 41.67 | $^\circ C/W$ |



Electrical Characteristics (T_A=25°C unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|---------------------|---|-----|------|------|------|
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} =0V I _D =-250μA | -30 | -33 | - | V |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =-30V, V _{GS} =0V | - | - | -1 | μA |
| Gate-Body Leakage Current | I _{GSS} | V _{GS} =±20V, V _{DS} =0V | - | - | ±100 | nA |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =-250μA | -1 | -1.5 | -3 | V |
| Drain-Source On-State Resistance | R _{DS(ON)} | V _{GS} =-10V, I _D =-10A | - | 9 | 15 | mΩ |
| | | V _{GS} =-4.5V, I _D =-7A | - | 18 | 25 | mΩ |
| Forward Transconductance | g _{FS} | V _{DS} =-10V, I _D =-10A | - | 20 | - | S |
| Input Capacitance | C _{iss} | V _{DS} =-15V, V _{GS} =0V, F=1.0MHz | - | 1750 | - | PF |
| Output Capacitance | C _{oss} | | - | 215 | - | PF |
| Reverse Transfer Capacitance | C _{rss} | | - | 180 | - | PF |
| Turn-on Delay Time | t _{d(on)} | V _{DD} =-15V, I _D =-10A, V _{GS} =-10V, R _{GEN} =1Ω | - | 9 | - | nS |
| Turn-on Rise Time | t _r | | - | 8 | - | nS |
| Turn-Off Delay Time | t _{d(off)} | | - | 28 | - | nS |
| Turn-Off Fall Time | t _f | | - | 10 | - | nS |
| Total Gate Charge | Q _g | V _{DS} =-15V, I _D =-10A, V _{GS} =-10V | - | 24 | - | nC |
| Gate-Source Charge | Q _{gs} | | - | 3.5 | - | nC |
| Gate-Drain Charge | Q _{gd} | | - | 6 | - | nC |
| Diode Forward Current ^(Note 2) | I _s | | - | - | -12 | A |
| Diode Forward Voltage ^(Note 3) | V _{SD} | V _{GS} =0V, I _s =-12A | - | - | -1.2 | V |

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. E_{AS} condition: T_j=25°C, V_{DD}=-15V, V_G=10V, L=0.5mH, R_g=25Ω, I_{AS}=-34A



Typical Electrical and Thermal Characteristics

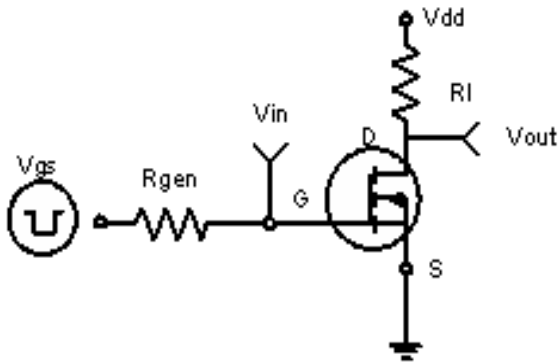


Figure 1: Switching Test Circuit

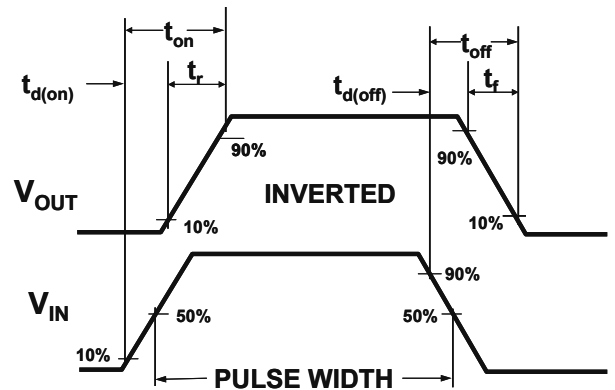
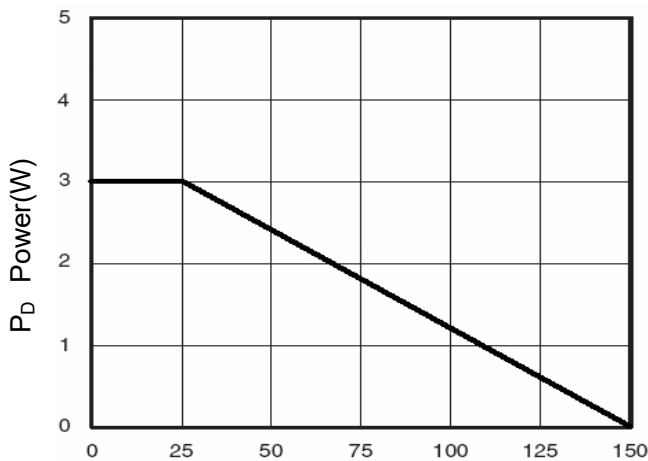
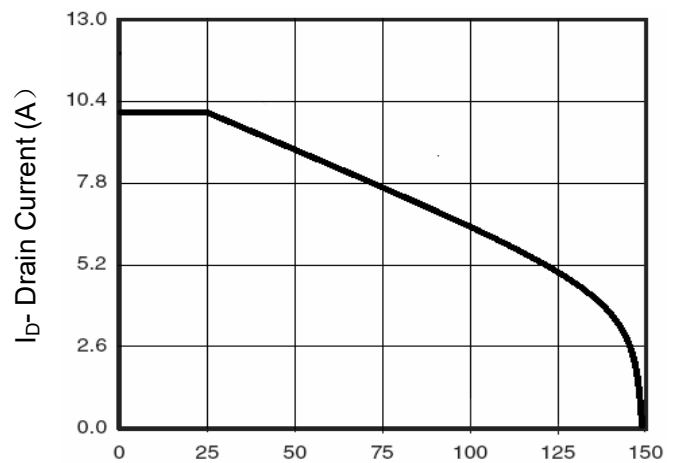


Figure 2: Switching Waveforms



T_J-Junction Temperature(°C)
Figure 3 Power Dissipation



T_J-Junction Temperature(°C)
Figure 4 Drain Current

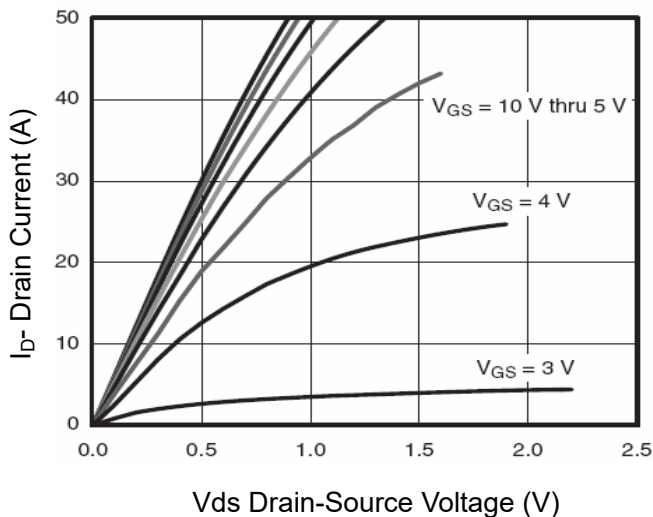


Figure 5 Output Characteristics

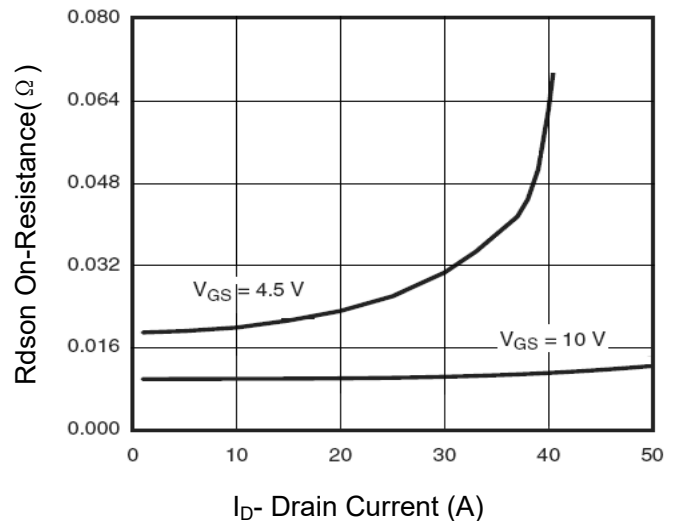


Figure 6 Drain-Source On-Resistance



Figure 5 Output Characteristics

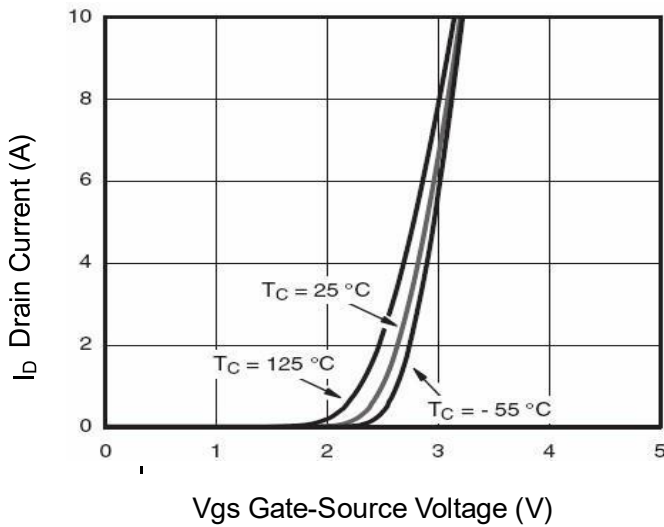


Figure 7 Transfer Characteristics

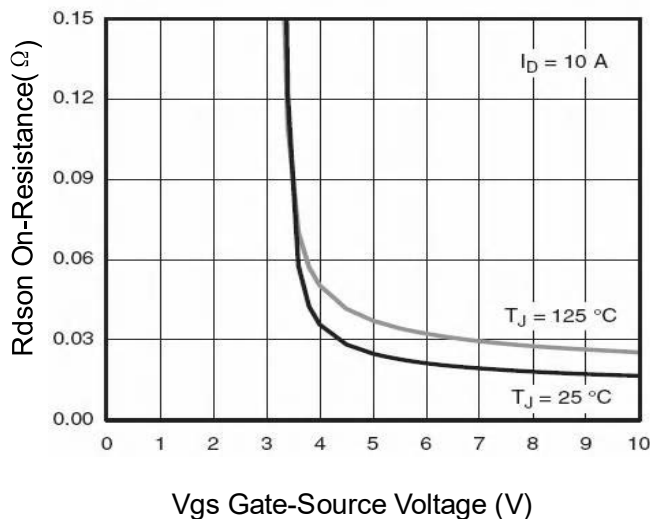


Figure 9 Rdson vs Vgs

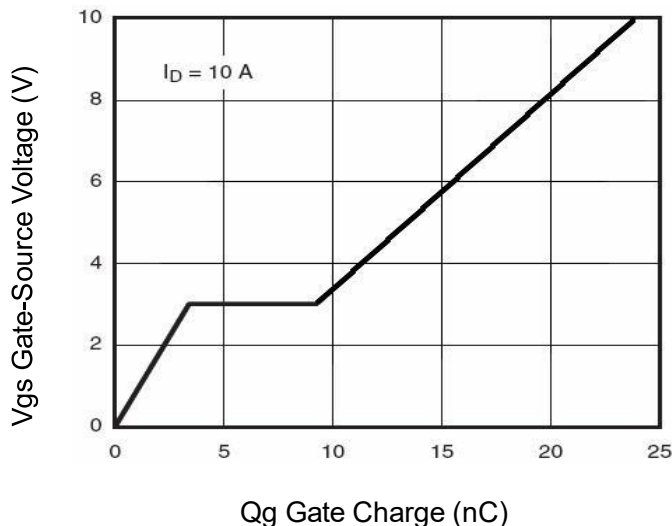


Figure 11 Gate Charge

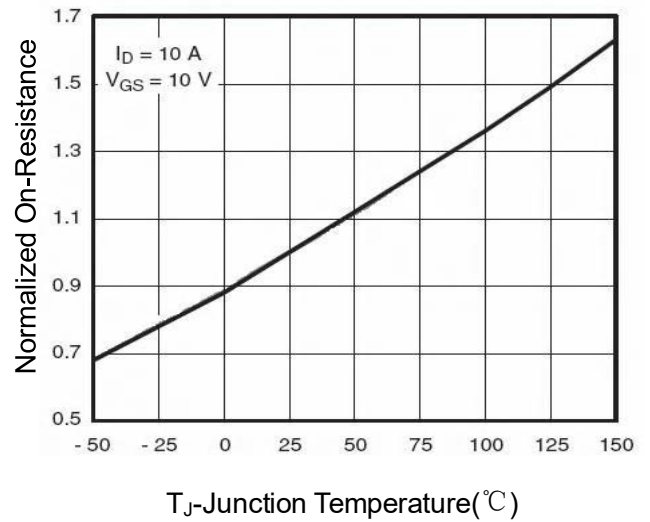


Figure 10 Capacitance vs Vds

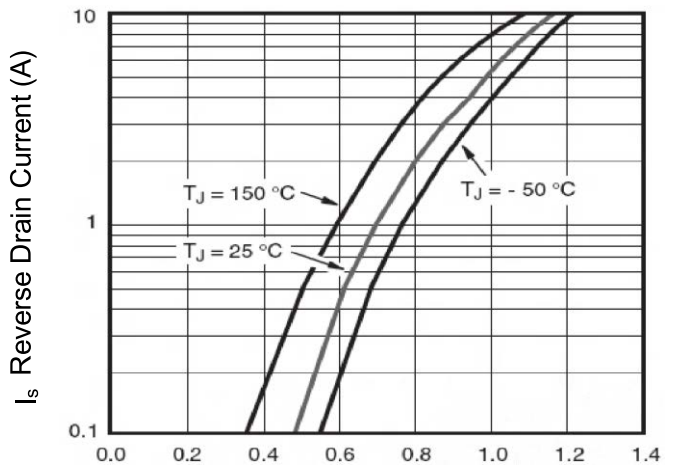
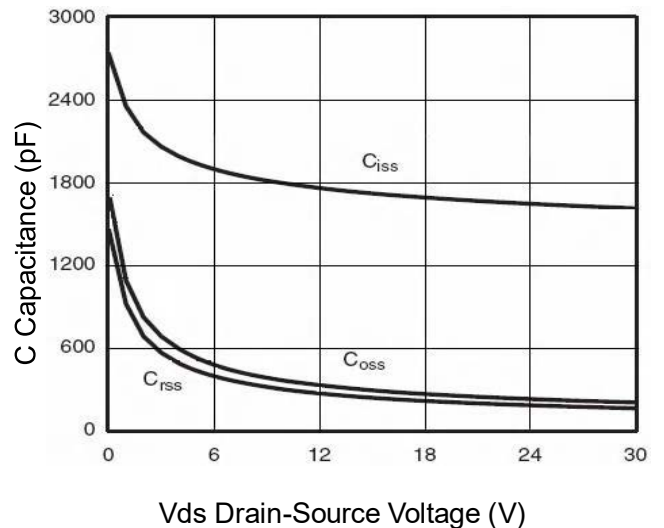


Figure 12 Source- Drain Diode Forward

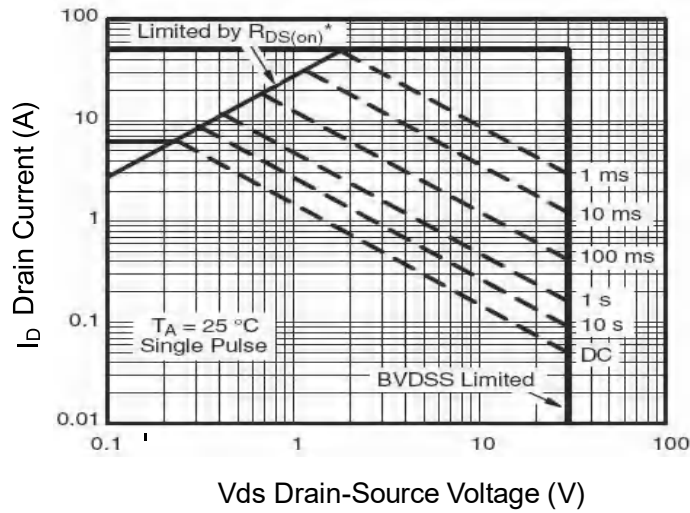


Figure 13 Safe Operation Area

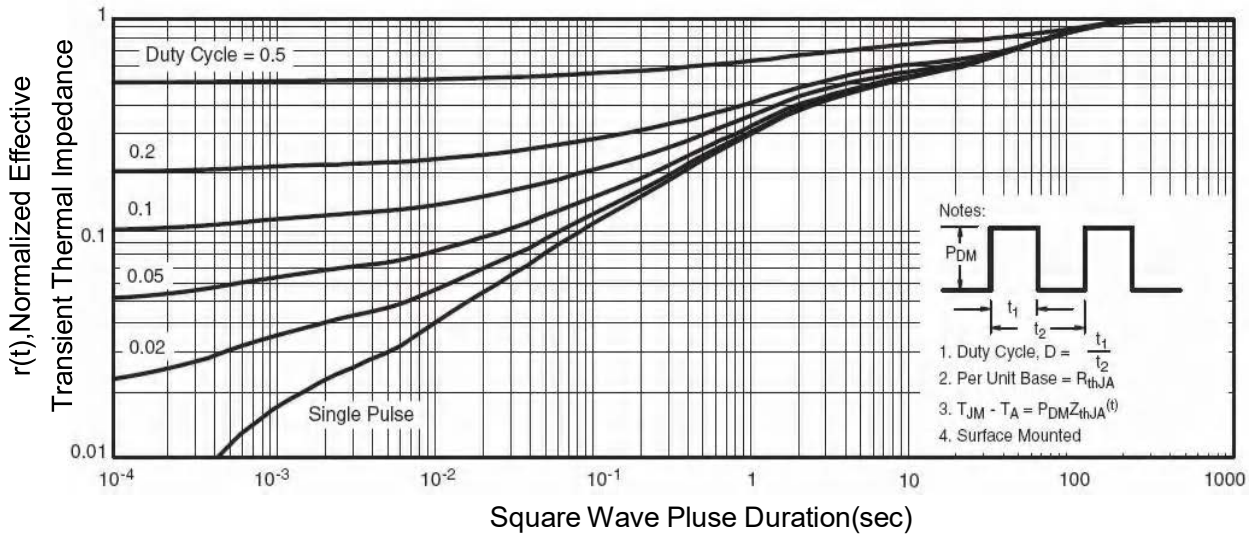
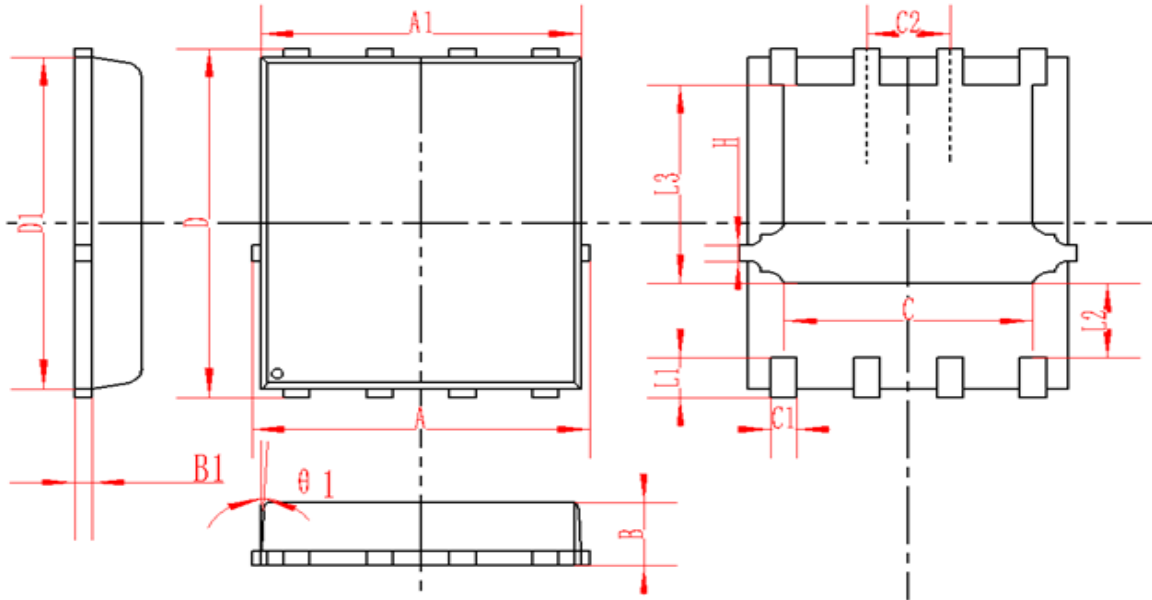


Figure 14 Normalized Maximum Transient Thermal Impedance



DFN5X6-8L Package Information



| SYMBOL | MM | | | INCH | | |
|------------|----------|------|-------|----------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 4.95 | 5 | 5.05 | 0.195 | 0.197 | 0.199 |
| A1 | 4.82 | 4.9 | 4.98 | 0.190 | 0.193 | 0.196 |
| D | 5.98 | 6 | 6.02 | 0.235 | 0.236 | 0.237 |
| D1 | 5.67 | 5.75 | 5.83 | 0.223 | 0.226 | 0.230 |
| B | 0.9 | 0.95 | 1 | 0.035 | 0.037 | 0.039 |
| B1 | 0.254REF | | | 0.010REF | | |
| C | 3.95 | 4 | 4.05 | 0.156 | 0.157 | 0.159 |
| C1 | 0.35 | 0.4 | 0.45 | 0.014 | 0.016 | 0.018 |
| C2 | 1.27TYP | | | 0.5TYP | | |
| $\theta 1$ | 8° | 10° | 12° | 8° | 10° | 12° |
| L1 | 0.63 | 0.64 | 0.65 | 0.025 | 0.025 | 0.026 |
| L2 | 1.2 | 1.3 | 1.4 | 0.047 | 0.051 | 0.055 |
| L3 | 3.415 | 3.42 | 3.425 | 0.134 | 0.135 | 0.135 |
| H | 0.24 | 0.25 | 0.26 | 0.009 | 0.010 | 0.010 |



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