

## P-Channel Enhancement Mode MOSFET

### 1. Product Information

#### 1.1 Features

- Surface-mounted package
- Advanced trench cell design

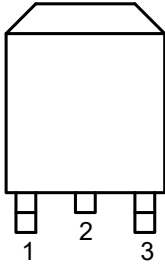
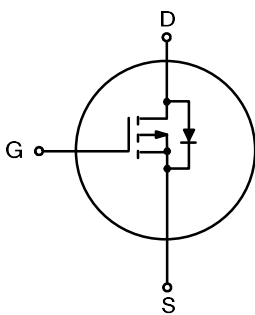
#### 1.2 Applications

- LCD TV appliances
- High power inverter system
- LCDM appliances

#### 1.3 Quick reference

- $BV \cong -100\text{ V}$
- $R_{DS(ON)} \leq 63\text{m}\Omega @ V_{GS} = -10\text{ V}$
- $P_{tot} \leq 50\text{ W}$
- $R_{DS(ON)} \leq 68\text{m}\Omega @ V_{GS} = -4.5\text{ V}$
- $I_D \leq -30\text{ A}$

### 2. Pin Description

| Pin | Description | Simplified Outline  | Symbol  |
|-----|-------------|---|---|
| 1   | Gate(G)     | <br><b>Top View</b><br><b>TO-252</b> |  |
| 2   | Drain(D)    |   |   |
| 3   | Source(S)   |   |   |

### 3. Limiting Values

| Symbol               | Parameter                               | Conditions                                       | Min   | Max  | Unit |
|----------------------|---|--|-------|------|------|
| V <sub>DS</sub>      | Drain-Source Voltage                    | T <sub>C</sub> = 25 °C                           | - 100 | -    | V    |
| V <sub>GS</sub>      | Gate-Source Voltage                     | T <sub>C</sub> = 25 °C                           | -     | ±20  | V    |
| I <sub>D</sub> *     | Drain Current ( DC )                    | T <sub>C</sub> = 25 °C, V <sub>GS</sub> = - 10 V | -     | - 30 | A    |
|                      |   | T <sub>C</sub> = 25 °C, V <sub>GS</sub> = - 10 V |       | - 18 | A    |
| I <sub>DM</sub> *,** | Drain Current ( Pulsed )                | T <sub>C</sub> = 25 °C, V <sub>GS</sub> = - 10 V | -     | - 76 | A    |
| P <sub>tot</sub>     | Drain power dissipation                 | T <sub>C</sub> = 25 °C                           | -     | 50   | W    |
| T <sub>stg</sub>     | Storage Temperature                     |  | -55   | 150  | °C   |
| T <sub>J</sub>       | Junction Temperature                    |  | -     | 150  | °C   |
| I <sub>S</sub>       | Continuous-Source Current               | T <sub>C</sub> = 25 °C                           | -     | - 30 | A    |
| E <sub>AS</sub> *    | Single Pulsed Avalanche Energy          | V <sub>DD</sub> = - 50 V , L= 1.0 mH             | -     | 242  | mJ   |
| R <sub>θJA</sub> *   | Thermal Resistance- Junction to Ambient |  | -     | 37   | °C/W |
| R <sub>θJC</sub> *   | Thermal Resistance- Junction to Case    |  | -     | 1.2  |      |

Notes :

- \* Surface Mounted on 1 in<sup>2</sup> pad area, t ≤ 10 sec
- \*\* Pulse width ≤ 300 μs, duty cycle ≤ 2 %

### 4. Marking Information

| Product Name | Marking   |
|--------------|---|
| UP30P10K     | <div style="display: flex; align-items: center;"> <div style="background-color: black; color: white; padding: 2px 5px; margin-right: 5px;"> <b>30P10</b><br/> <b>YWWXXX</b> </div> <b>YWWXXX:</b><br/>                     Date Code                 </div> |

### 5. Ordering Code

| Product Name | Package | Reel Size | Tape width | Quantity | Note |
|--------------|---------|-----------|------------|----------|------|
| UP30P10K     | TO252   |           |            | 2500     |      |

Note: UOE defines “ Green ” as lead-free ( RoHS compliant ) and halogen free ( Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC / JEDEC J-STD-020C )

## 6. Electrical Characteristics (T<sub>A</sub> = 25 °C Unless Otherwise Noted)

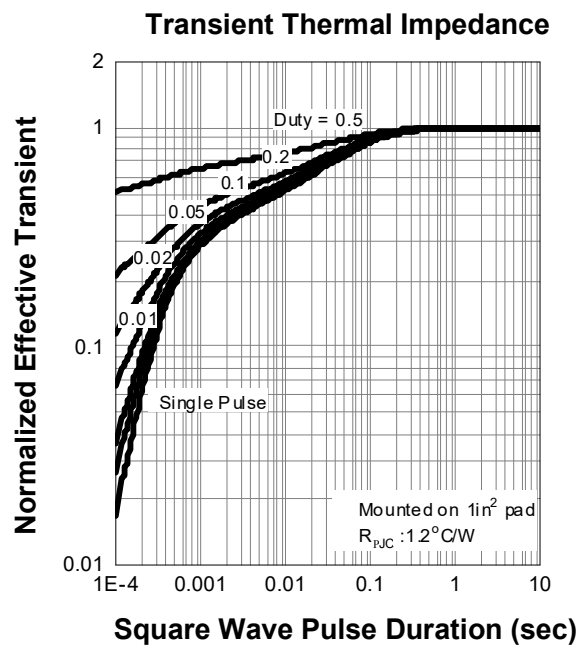
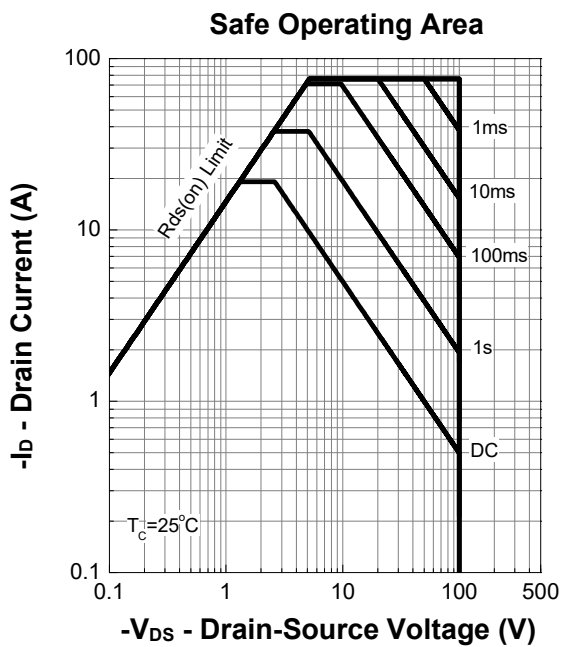
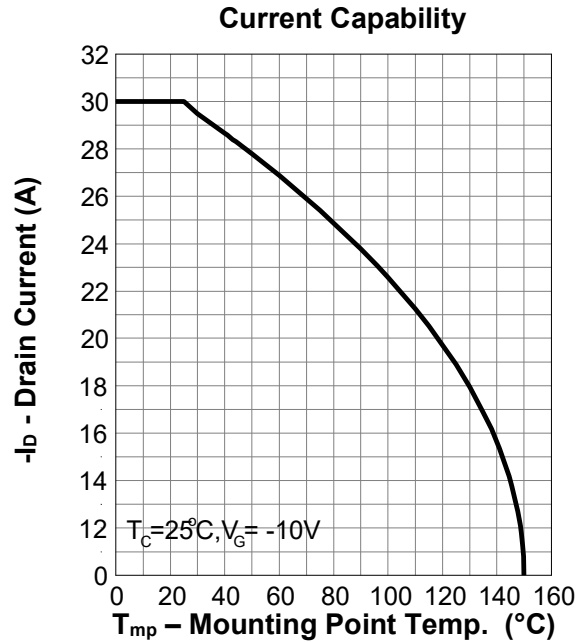
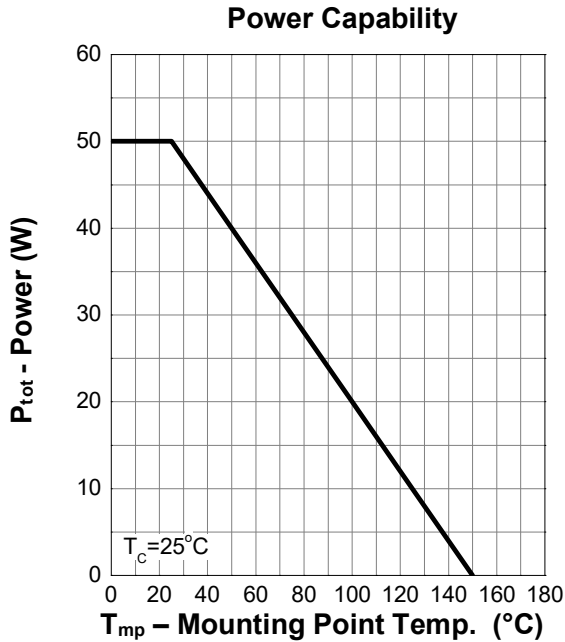
| Symbol   | Parameter                      | Conditions  | Min   | Typ  | Max   | Unit |
|--|--------------------------------|---|-------|------|-------|------|
| <b>Static Characteristics</b>                  |                                |   |       |      |       |      |
| BV <sub>DSS</sub>                              | Drain-Source Breakdown Voltage | V <sub>GS</sub> = 0 V, I <sub>DS</sub> = - 250 μA   | - 100 | -    | -     | V    |
| V <sub>GS(th)</sub>                            | Gate Threshold Voltage         | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>DS</sub> = - 250 μA  | - 1   | -    | - 3   | V    |
| I <sub>DSS</sub>                               | Drain Leakage Current          | V <sub>DS</sub> = - 50 V, V <sub>GS</sub> = 0 V   | -     | -    | - 1   | μA   |
|  |                                | T <sub>J</sub> = 85 °C  | -     | -    | - 30  | μA   |
| I <sub>GSS</sub>                               | Gate Leakage Current           | V <sub>GS</sub> = 0 V, V <sub>GS</sub> = ± 20 V   | -     | -    | ±100  | nA   |
| R <sub>DS(ON)</sub> <sup>a</sup>               | On-State Resistance            | V <sub>GS</sub> = - 10 V, I <sub>DS</sub> = - 10 A  | -     | 56   | 63    | mΩ   |
|  |                                | V <sub>GS</sub> = - 4.5 V, I <sub>DS</sub> = - 5 A  | -     | 63   | 68    |      |
| <b>Diode Characteristics</b>                   |                                |   |       |      |       |      |
| V <sub>SD</sub> <sup>a</sup>                   | Diode Forward Voltage          | I <sub>SD</sub> = - 10 A, V <sub>GS</sub> = 0 V   | -     | -    | - 1.2 | V    |
| t <sub>rr</sub>                                | Reverse Recovery Time          | I <sub>DS</sub> = - 10 A, dI <sub>SD</sub> /dt = 100 A/μs   | -     | 32   | -     | nS   |
| Q <sub>rr</sub>                                | Reverse Recovery Charge        |   | -     | 49   | -     | nC   |
| <b>Dynamic Characteristics<sup>b</sup></b>     |                                |   |       |      |       |      |
| C <sub>iss</sub>                               | Input Capacitance              | V <sub>GS</sub> = 0 V, V <sub>DS</sub> = - 50 V<br>Frequency = 1 MHz  | -     | 4507 | -     | pF   |
| C <sub>oss</sub>                               | Output Capacitance             |   | -     | 97   | -     |      |
| C <sub>rss</sub>                               | Reverse Transfer Capacitance   |   | -     | 15   | -     |      |
| t <sub>d(on)</sub>                             | Turn-on Delay Time             | V <sub>DS</sub> = - 50 V, V <sub>GEN</sub> = - 10 V,<br>R <sub>G</sub> = 4.5 Ω, R <sub>L</sub> = 5 Ω,<br>I <sub>DS</sub> = - 10 A | -     | 49   | -     | nS   |
| t <sub>r</sub>                                 | Turn-on Rise Time              |   | -     | 71   | -     |      |
| t <sub>d(off)</sub>                            | Turn-off Delay Time            |   | -     | 555  | -     |      |
| t <sub>f</sub>                                 | Turn-off Fall Time             |   | -     | 187  | -     |      |
| <b>Gate Charge Characteristics<sup>b</sup></b> |                                |   |       |      |       |      |
| Q <sub>g</sub>                                 | Total Gate Charge              | V <sub>DS</sub> = - 50 V, V <sub>GS</sub> = - 10 V,<br>I <sub>DS</sub> = - 10 A   | -     | 73   | -     | nC   |
| Q <sub>gs</sub>                                | Gate-Source Charge             |   | -     | 17   | -     |      |
| Q <sub>gd</sub>                                | Gate-Drain Charge              |   | -     | 9.1  | -     |      |

Notes :

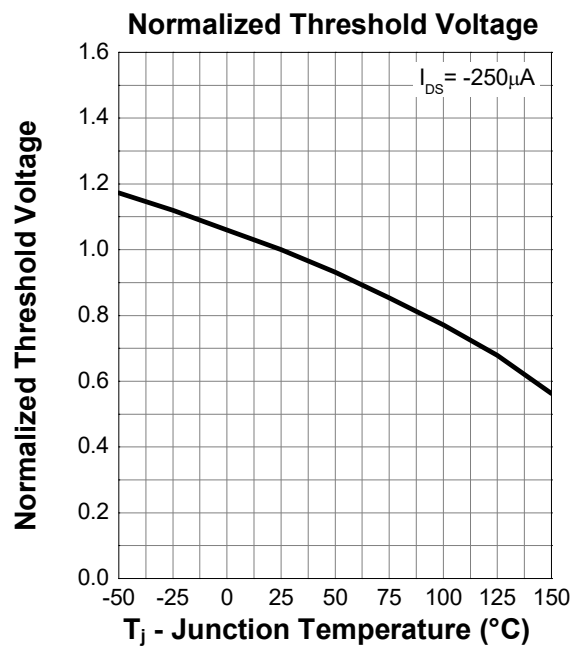
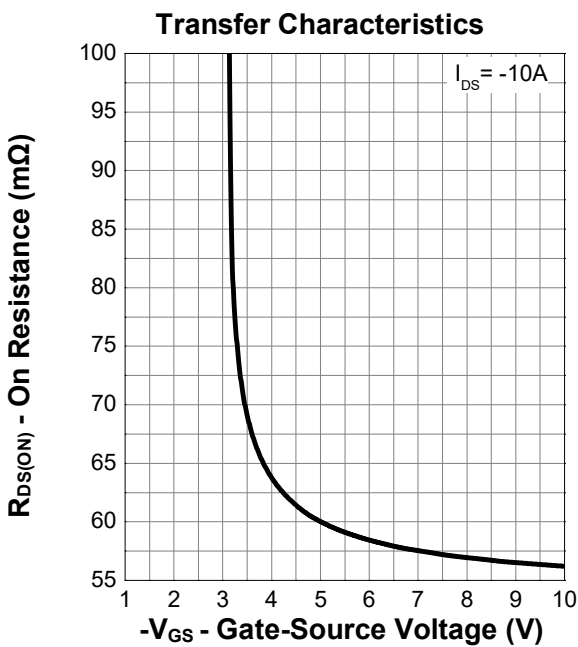
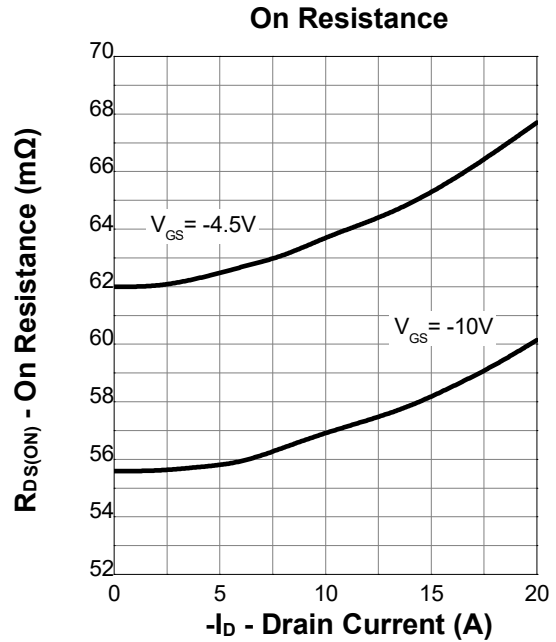
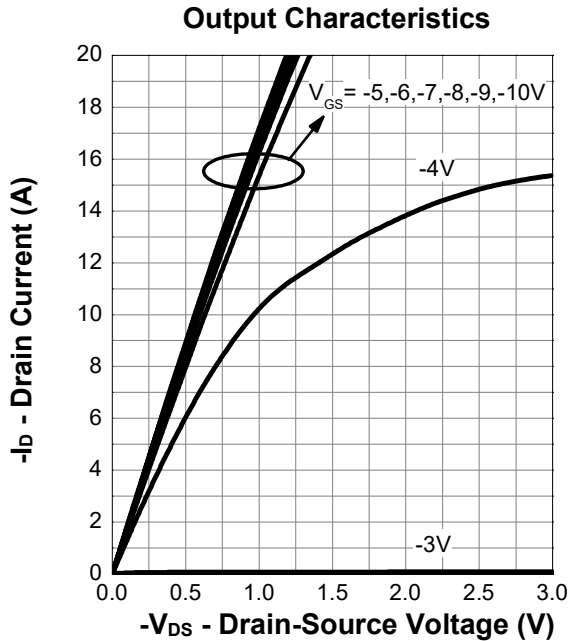
a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2%

b : Guaranteed by design, not subject to production testing

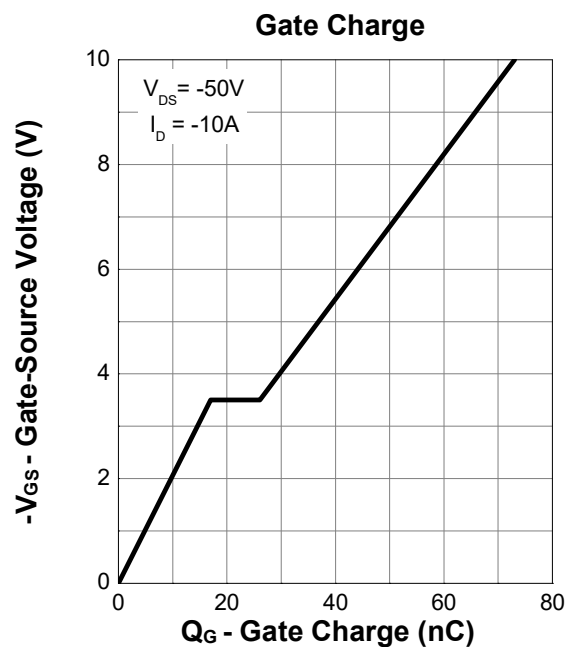
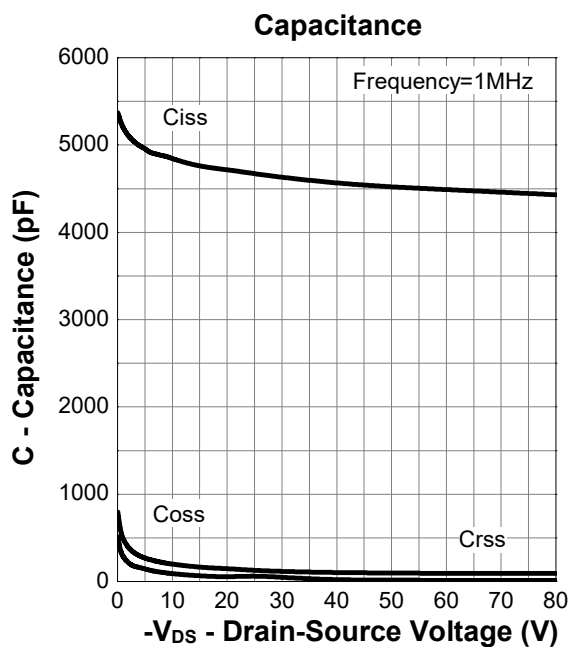
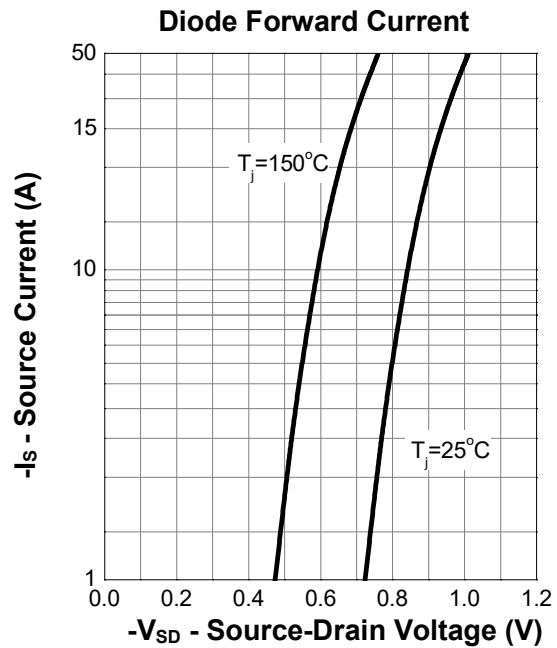
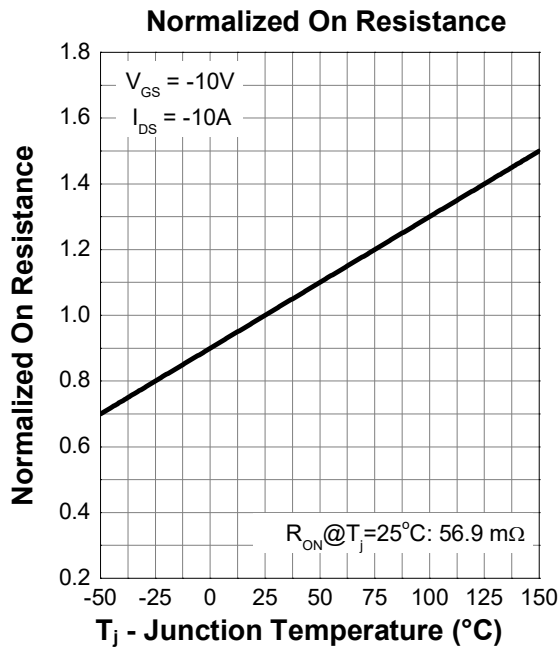
### 7. Typical Characteristics



7. Typical Characteristics (cont.)

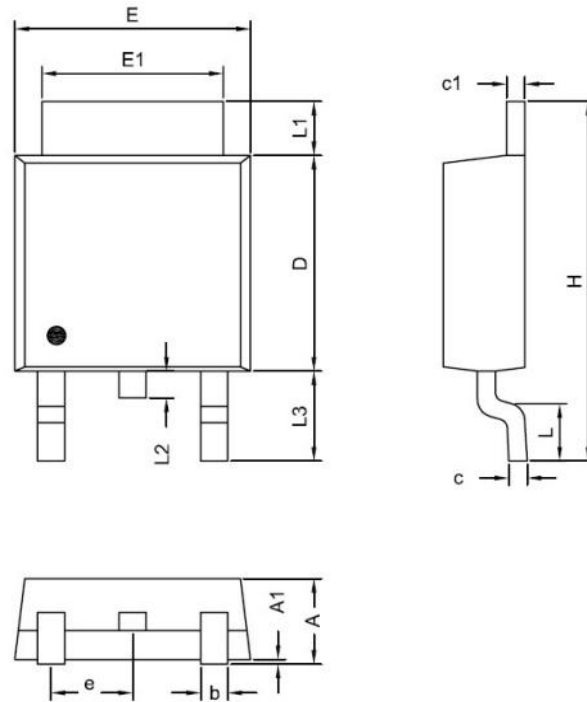


### 7. Typical Characteristics (cont.)



## 8.Package Dimensions

TO252-3L



| Symbol | Dimensions In Millimeters |       |
|--------|---------------------------|-------|
|        | MIN.                      | MAX.  |
| A      | 2.19                      | 2.38  |
| A1     | 0.02                      | 0.13  |
| D      | 5.30                      | 6.40  |
| E      | 6.35                      | 6.80  |
| E1     | 5.20                      | 5.50  |
| c      | 0.40                      | 0.60  |
| c1     | 0.40                      | 0.60  |
| b      | 0.55                      | 0.85  |
| e      | 2.30 BCS                  |       |
| L      | 1.00                      | 1.80  |
| L1     | 0.70                      | 1.80  |
| L2     | 0.70 BCS                  |       |
| L3     | 2.40                      | 2.80  |
| H      | 9.20                      | 10.40 |