



**Features**

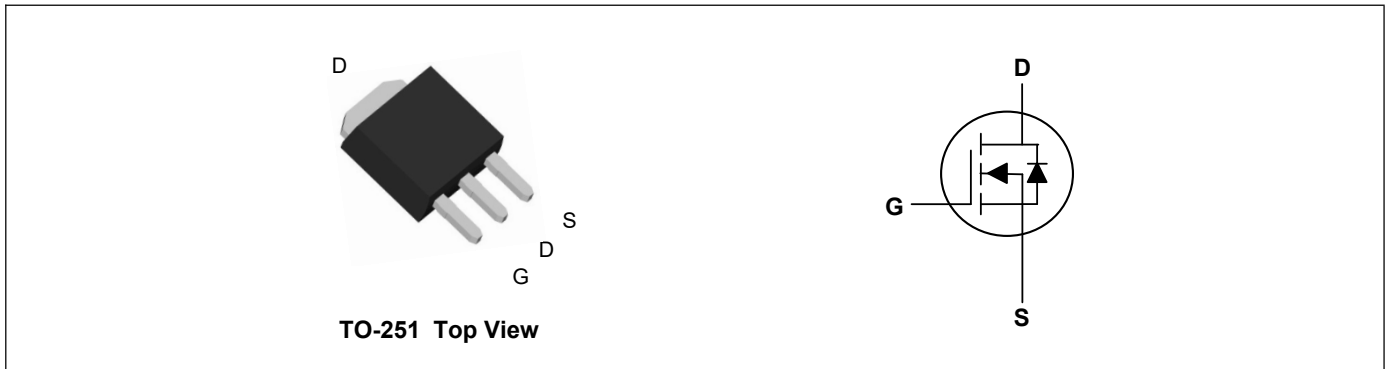
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

**Product Summary**

|                                  |      |            |
|----------------------------------|------|------------|
| $V_{DS}$                         | 80   | V          |
| $I_D$                            | 62   | A          |
| $R_{DS(ON)}$ (at $V_{GS}=10V$ )  | 12   | m $\Omega$ |
| $R_{DS(ON)}$ (at $V_{GS}=4.5V$ ) | 14.5 | m $\Omega$ |

**Applications**

- High Frequency Point-of-Load, Synchronous Buck Converter
- Networking DC-DC Power System
- Load Switch



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

| Parameter   | Symbol                | Rating     | Units       |
|---|-----------------------|------------|-------------|
| Drain-Source Voltage                                  | $V_{DS}$              | 80         | V           |
| Gate-Source Voltage                                   | $V_{GS}$              | $\pm 20$   | V           |
| Continuous Drain Current, $V_{GS}$ @ 10V <sup>1</sup> | $I_D@T_C=25^{\circ}C$ | 62         | A           |
| Continuous Drain Current, $V_{GS}$ @ 10V <sup>1</sup> | $I_D@T_C=70^{\circ}C$ | 49         | A           |
| Pulsed Drain Current <sup>2</sup>                     | $I_{DM}$              | 200        | A           |
| Single Pulse Avalanche Energy <sup>3</sup>            | EAS                   | 80         | mJ          |
| Total Power Dissipation <sup>4</sup>                  | $P_D@T_C=25^{\circ}C$ | 89         | W           |
| Storage Temperature Range                             | $T_{STG}$             | -55 to 150 | $^{\circ}C$ |
| Operating Junction Temperature Range                  | $T_J$                 | -55 to 150 | $^{\circ}C$ |

**Thermal Characteristics**

| Parameter  | Symbol          | Typ | Max  | Unit          |
|--|-----------------|-----|------|---------------|
| Thermal Resistance Junction-Ambient <sup>1</sup> | $R_{\theta JA}$ | --- | 62.5 | $^{\circ}C/W$ |
| Thermal Resistance Junction-Case <sup>1</sup>    | $R_{\theta JC}$ | --- | 1.4  | $^{\circ}C/W$ |

**Electrical Characteristics (T<sub>J</sub>=25°C, unless otherwise noted)**

| Parameter                                      | Symbol              | Conditions   | Min | Typ  | Max  | Unit |
|--|---------------------|--|-----|------|------|------|
| Drain-Source Breakdown Voltage                 | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =250uA   | 80  | ---  | ---  | V    |
| Static Drain-Source On-Resistance <sup>2</sup> | R <sub>DS(ON)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =8A   | --- | 9.6  | 12   | mΩ   |
|  |                     | V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A  | --- | 12   | 14.5 | mΩ   |
| Gate Threshold Voltage                         | V <sub>GS(th)</sub> | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA                             | 1.2 | ---  | 2.5  | V    |
| Drain-Source Leakage Current                   | I <sub>DSS</sub>    | V <sub>DS</sub> =64V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C                      | --- | ---  | 1    | uA   |
|  |                     | V <sub>DS</sub> =64V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C                      | --- | ---  | 5    |      |
| Gate-Source Leakage Current                    | I <sub>GSS</sub>    | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V   | --- | ---  | ±100 | nA   |
| Forward Transconductance                       | g <sub>fs</sub>     | V <sub>DS</sub> =5V, I <sub>D</sub> =10A   | --- | 32   | ---  | S    |
| Gate Resistance                                | R <sub>g</sub>      | V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz                                     | --- | 0.66 | ---  | Ω    |
| Total Gate Charge                              | Q <sub>g</sub>      | V <sub>DS</sub> =64V, V <sub>GS</sub> =10V, I <sub>D</sub> =4A                       | --- | 60.9 | ---  | nC   |
| Gate-Source Charge                             | Q <sub>gs</sub>     |  | --- | 8.1  | ---  |      |
| Gate-Drain Charge                              | Q <sub>gd</sub>     |  | --- | 17.9 | ---  |      |
| Turn-On Delay Time                             | T <sub>d(on)</sub>  | V <sub>DD</sub> =40V, V <sub>GS</sub> =10V, R <sub>G</sub> =3.3Ω, I <sub>D</sub> =4A | --- | 12.2 | ---  | ns   |
| Rise Time                                      | T <sub>r</sub>      |  | --- | 24.5 | ---  |      |
| Turn-Off Delay Time                            | T <sub>d(off)</sub> |  | --- | 50.5 | ---  |      |
| Fall Time                                      | T <sub>f</sub>      |  | --- | 17.6 | ---  |      |
| Input Capacitance                              | C <sub>iss</sub>    | V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHz                                    | --- | 3120 | ---  | pF   |
| Output Capacitance                             | C <sub>oss</sub>    |  | --- | 140  | ---  |      |
| Reverse Transfer Capacitance                   | C <sub>rss</sub>    |  | --- | 110  | ---  |      |

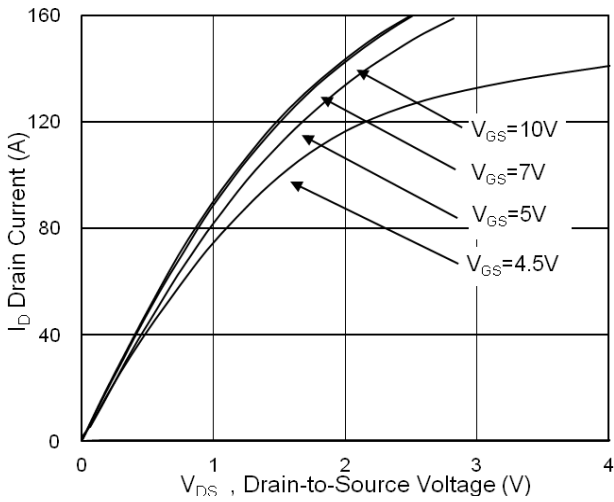
**Drain-Source Diode Characteristics**

| Parameter                                | Symbol          | Conditions  | Min | Typ  | Max | Unit |
|--|-----------------|---|-----|------|-----|------|
| Continuous Source Current <sup>1,5</sup> | I <sub>S</sub>  | V <sub>G</sub> =V <sub>D</sub> =0V, Force Current             | --- | ---  | 62  | A    |
| Diode Forward Voltage <sup>2</sup>       | V <sub>SD</sub> | V <sub>GS</sub> =0V, I <sub>S</sub> =1A, T <sub>J</sub> =25°C | --- | ---  | 1.2 | V    |
| Reverse Recovery Time                    | t <sub>rr</sub> | I <sub>F</sub> =4A, di/dt=100A/μs, T <sub>J</sub> =25°C       | --- | 18.6 | --- | nS   |
| Reverse Recovery Charge                  | Q <sub>rr</sub> |   | --- | 65   | --- | nC   |

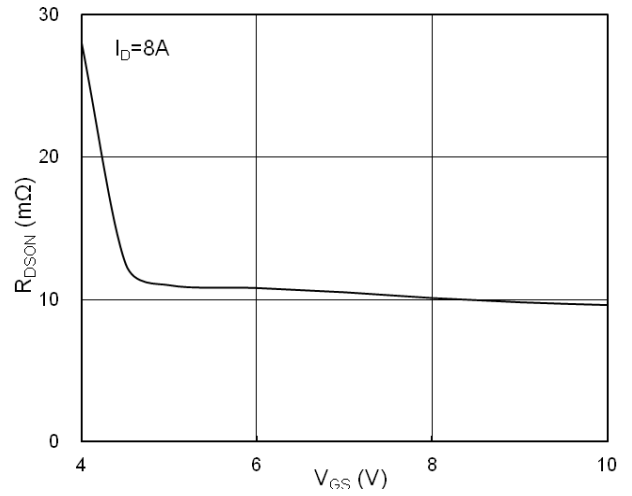
**Note:**

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2.The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
- 3.The EAS data shows Max. rating. The test condition is V<sub>DD</sub>=50V, V<sub>GS</sub>=10V, L=0.1mH
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub>, in real applications, should be limited by total power dissipation.

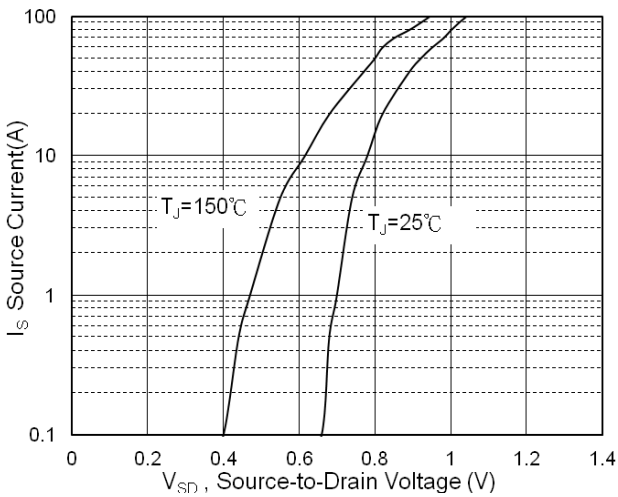
**Typical Characteristics**



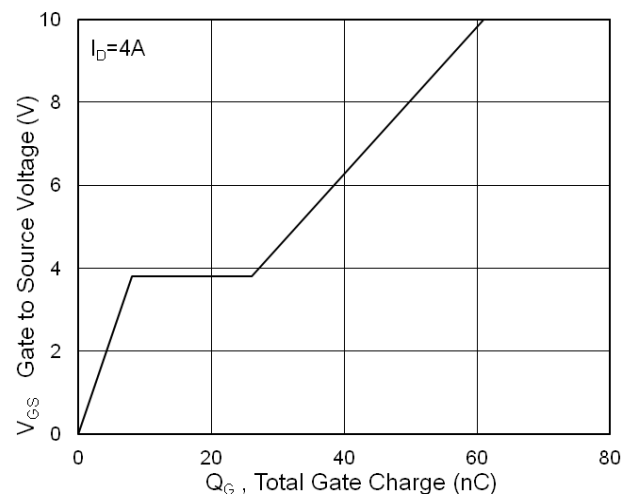
**Fig.1 Typical Output Characteristics**



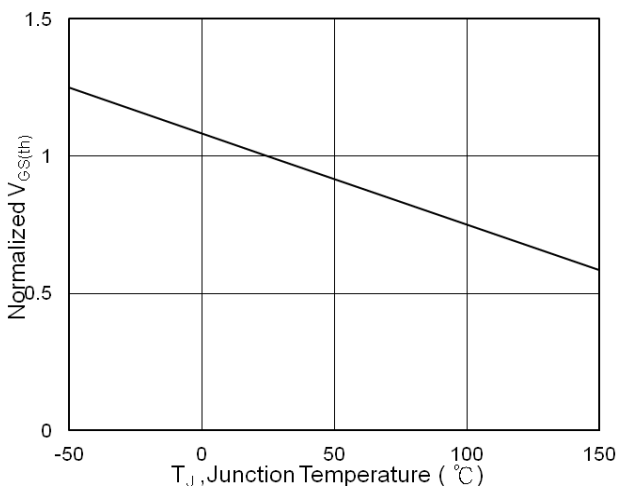
**Fig.2 On-Resistance v.s Gate-Source**



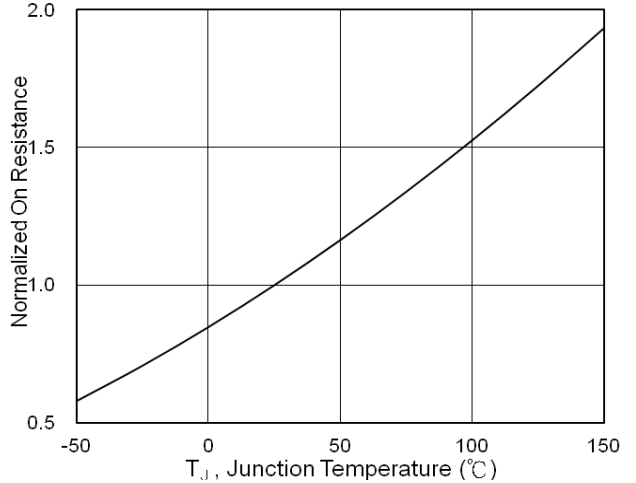
**Fig.3 Forward Characteristics of Reverse**



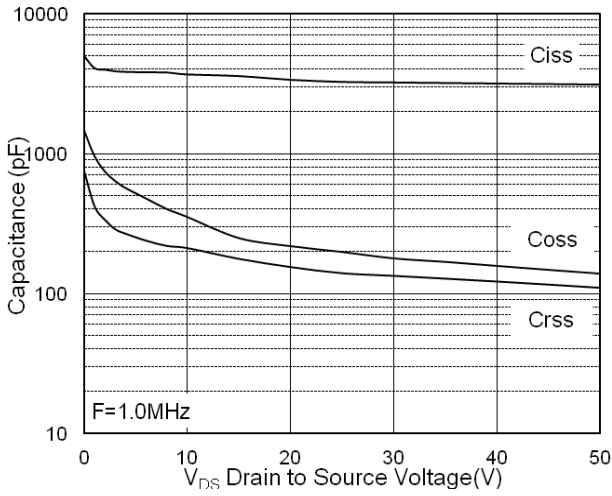
**Fig.4 Gate-Charge Characteristics**



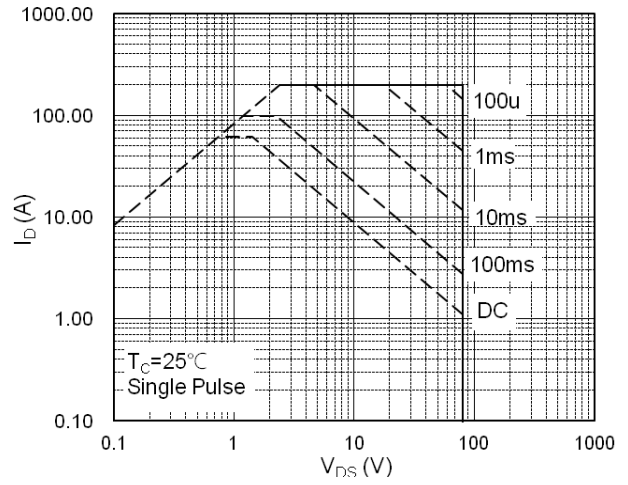
**Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$**



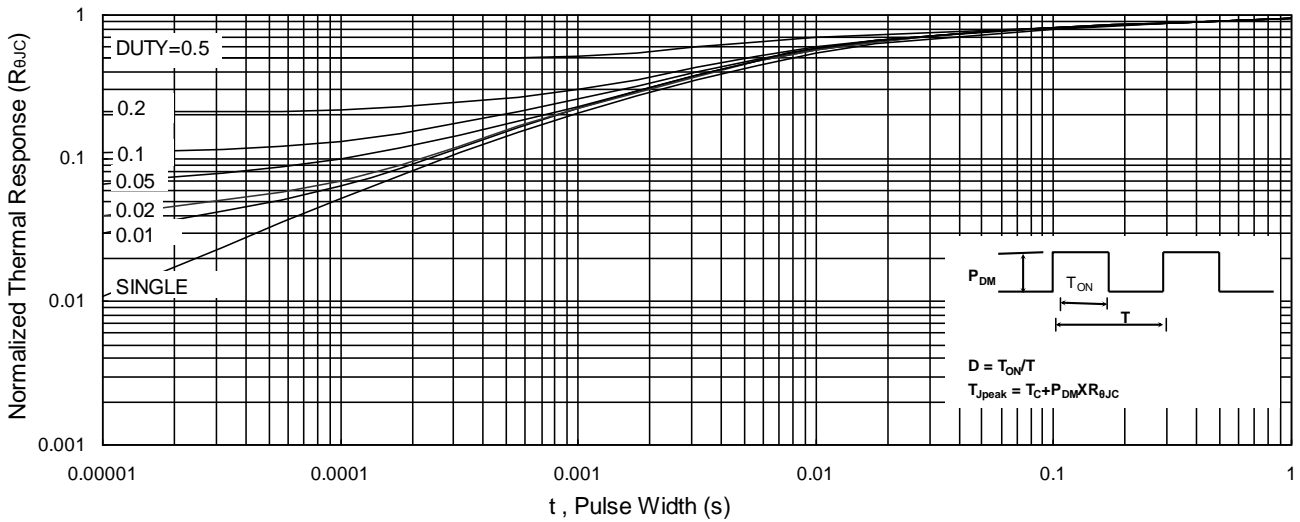
**Fig.6 Normalized  $R_{DSON}$  vs.  $T_J$**



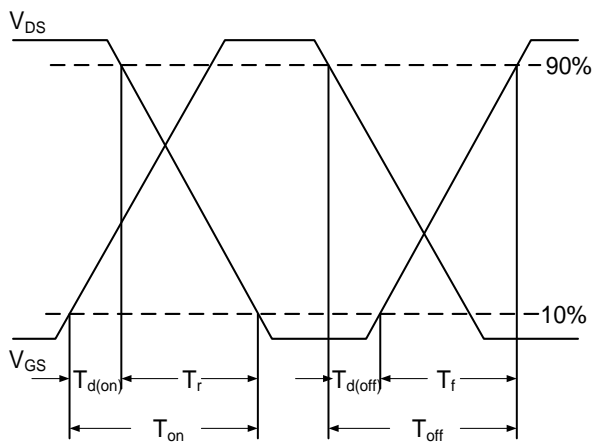
**Fig.7 Capacitance**



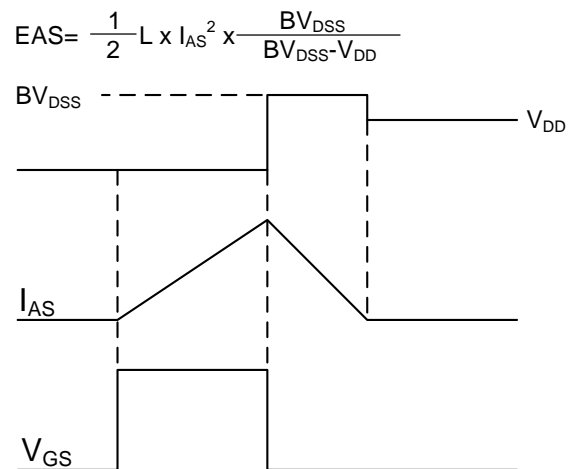
**Fig.8 Safe Operating Area**



**Fig.9 Normalized Maximum Transient Thermal Impedance**

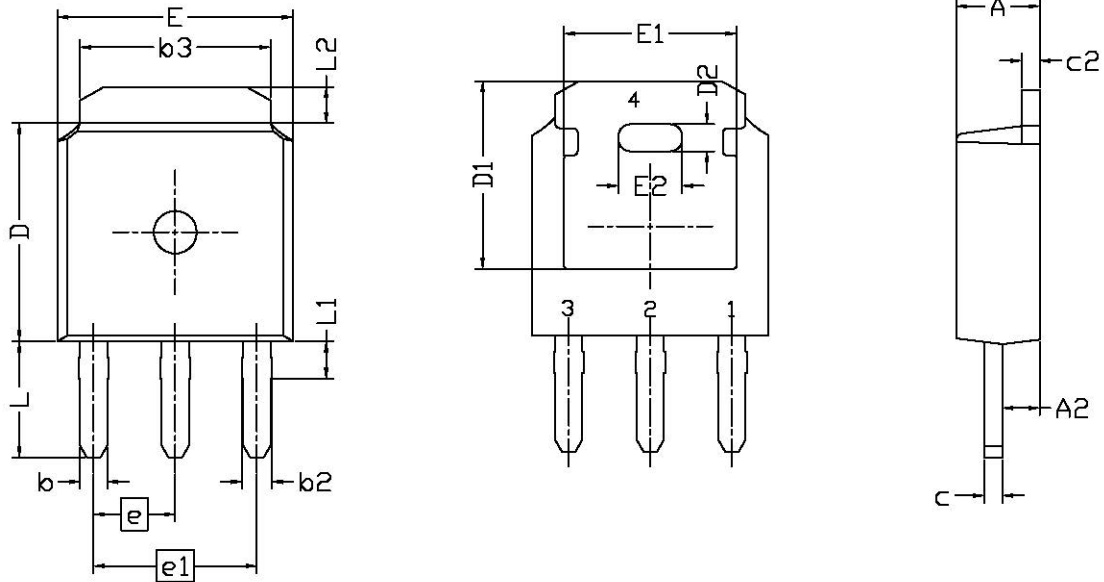


**Fig.10 Switching Time Waveform**



**Fig.11 Unclamped Inductive Switching Waveform**

**TO-251 Package Outline Dimensions**



| Symbol    | Dimensions (unit:mm) |      |      | Symbol    | Dimensions (unit:mm) |      |      |
|-----------|----------------------|------|------|-----------|----------------------|------|------|
|           | Min                  | Typ  | Max  |           | Min                  | Typ  | Max  |
| <b>A</b>  | 2.20                 | 2.30 | 2.39 | <b>A2</b> | 0.90                 | 1.00 | 1.14 |
| <b>b</b>  | 0.63                 | 0.76 | 0.85 | <b>b2</b> | 0.76                 | 0.85 | 1.05 |
| <b>b3</b> | 5.10                 | 5.40 | 5.60 | <b>C</b>  | 0.46                 | 0.51 | 0.61 |
| <b>C2</b> | 0.46                 | 0.51 | 0.61 | <b>D</b>  | 5.90                 | 6.10 | 6.30 |
| <b>D1</b> | 5.25 REF             |      |      | <b>D2</b> | 0.508 BSC            |      |      |
| <b>E</b>  | 6.35                 | 6.55 | 6.70 | <b>E1</b> | 5.06 REF             |      |      |
| <b>E2</b> | 1.524 BSC            |      |      | <b>e</b>  | 2.29 BSC             |      |      |
| <b>e1</b> | 4.57 BSC             |      |      | <b>L</b>  | 3.70                 | 4.00 | 4.40 |
| <b>L1</b> | 1.15 REF             |      |      | <b>L2</b> | 0.90                 | 1.06 | 1.20 |