

## Features

- Surface-mounted package
- Advanced trench cell design

## Application

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

## Product Summary



|                                 |     |    |
|---------------------------------|-----|----|
| $V_{DS}$                        | 100 | V  |
| $R_{DS(on), Typ @ V_{GS}=10 V}$ | 1.1 | mΩ |
| $I_D$                           | 300 | A  |



## Limiting Values

| Symbol               | Parameter                               | Conditions                                                | Min | Max  | Unit                 |
|----------------------|-----------------------------------------|-----------------------------------------------------------|-----|------|----------------------|
| $V_{DS}$             | Drain-Source Voltage                    | $T_C = 25\text{ }^{\circ}\text{C}$                        | -   | 100  | V                    |
| $V_{GS}$             | Gate-Source Voltage                     | $T_C = 25\text{ }^{\circ}\text{C}$                        | -   | ±20  | V                    |
| $I_D^{*,***}$        | Drain Current ( DC )                    | $T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$  | -   | 300  | A                    |
|                      |                                         | $T_C = 100\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$ | -   | 282  | A                    |
| $I_{DM}^{*,***,***}$ | Drain Current ( Pulsed )                | $T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$  | -   | 1200 | A                    |
| $P_{tot}$            | Drain power dissipation                 | $T_C = 25\text{ }^{\circ}\text{C}$                        | -   | 500  | W                    |
| $T_{stg}$            | Storage Temperature                     |                                                           | -55 | 150  | $^{\circ}\text{C}$   |
| $T_J$                | Junction Temperature                    |                                                           | -   | 150  | $^{\circ}\text{C}$   |
| $I_S$                | Continuous-Source Current               | $T_C = 25\text{ }^{\circ}\text{C}$                        | -   | 300  | A                    |
| $E_{AS}$             | Single Pulsed Avalanche Energy          | $V_{DD}=50\text{ V}, L=1.0\text{ mH}$                     | -   | 2592 | mJ                   |
| $R_{\theta JA}^{**}$ | Thermal Resistance- Junction to Ambient |                                                           | -   | 40   | $^{\circ}\text{C/W}$ |
| $R_{\theta JC}^{**}$ | Thermal Resistance- Junction to Case    |                                                           | -   | 0.25 |                      |

Notes :

- \* Pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$
- \*\* Surface Mounted on minimum footprint pad area.
- \*\*\* Limited by bonding wire

**Electrical Characteristics** (  $T_A=25^\circ$  Unless Otherwise Noted )

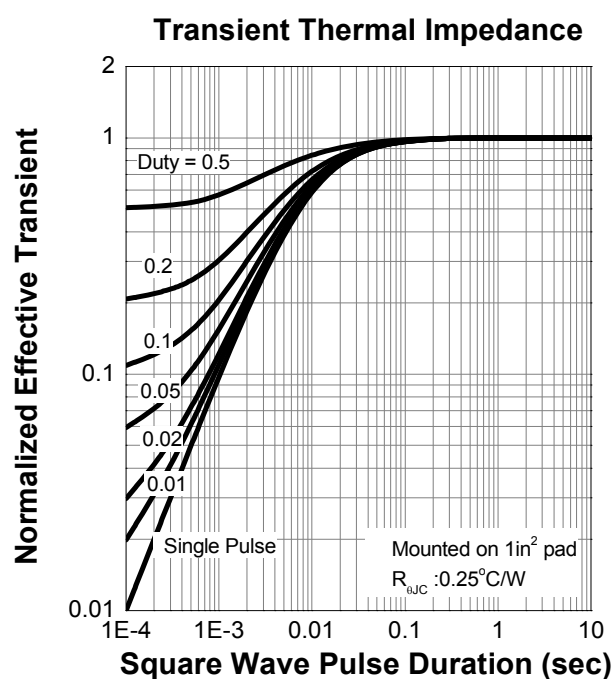
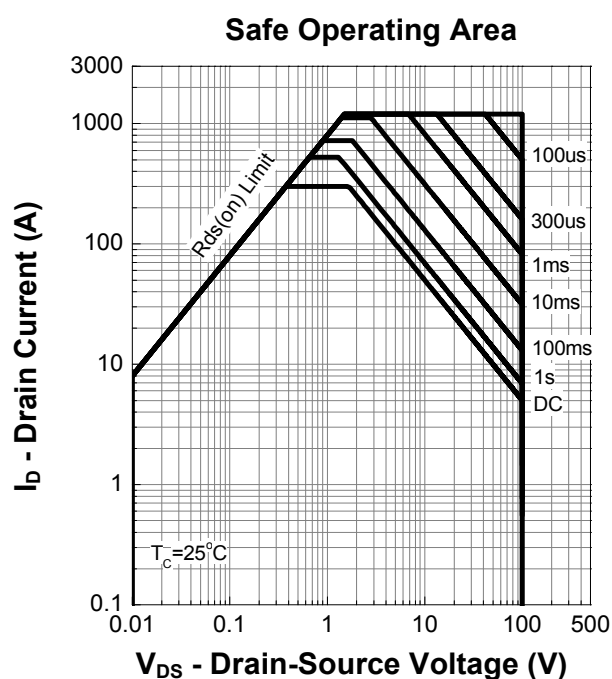
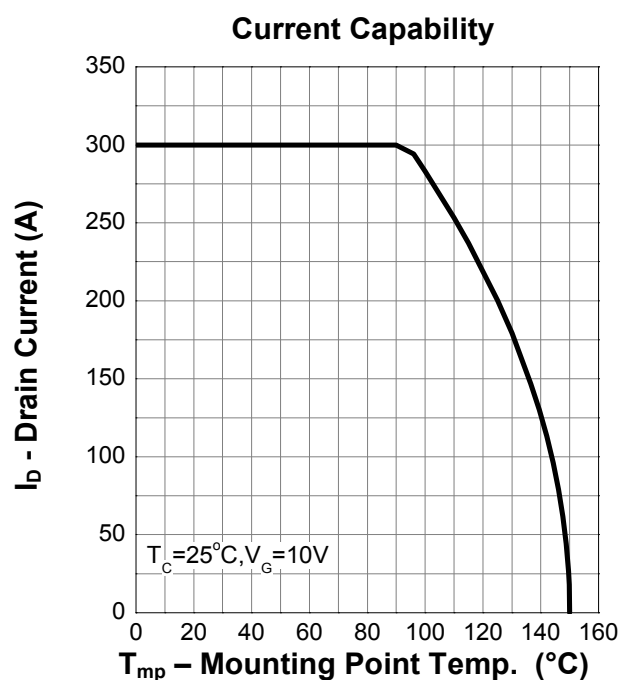
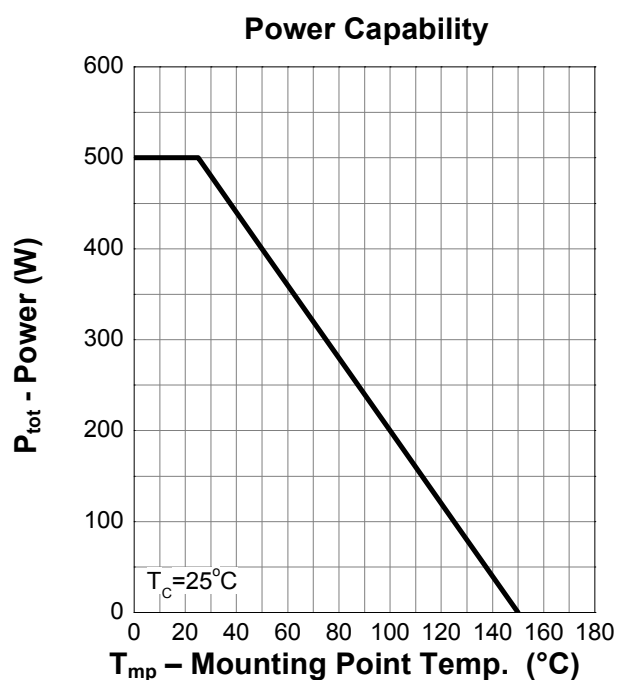
| Symbol                                   | Parameter                      | Conditions                                                                                                                     | Min | Typ   | Max  | Unit |
|------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-----|-------|------|------|
| Static Characteristics                   |                                |                                                                                                                                |     |       |      |      |
| 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                                                                   | 2   | 2.89  | 4    | V    |
| I <sub>DSS</sub>                         | Drain Leakage Current          | V <sub>DS</sub> = 80 V, V <sub>GS</sub> = 0 V                                                                                  | -   | -     | 1    | 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> = 20 A                                                                                 | -   | 1.1   | 1.3  | mΩ   |
|                                          |                                | V <sub>GS</sub> = 6 V, I <sub>DS</sub> = 20 A                                                                                  | -   | 1.43  | 2.0  |      |
| Diode Characteristics                    |                                |                                                                                                                                |     |       |      |      |
| V <sub>SD</sub> <sup>a</sup>             | Diode Forward Voltage          | I <sub>SD</sub> = 30 A, V <sub>GS</sub> = 0 V                                                                                  | -   | -     | 1.3  | V    |
| t <sub>rr</sub>                          | Reverse Recovery Time          | I <sub>DS</sub> = 30 A, V <sub>GS</sub> = 0 V<br>dI <sub>SD</sub> /dt = 100 A/μs                                               | -   | 121   | -    | nS   |
| Q <sub>rr</sub>                          | Reverse Recovery Charge        |                                                                                                                                | -   | 405   | -    | nC   |
| Dynamic Characteristics <sup>b</sup>     |                                |                                                                                                                                |     |       |      |      |
| C <sub>iss</sub>                         | Input Capacitance              | V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 50 V<br>Frequency = 1 MHz                                                             | -   | 13215 | -    | pF   |
| C <sub>oss</sub>                         | Output Capacitance             |                                                                                                                                | -   | 2075  | -    |      |
| C <sub>rss</sub>                         | Reverse Transfer Capacitance   |                                                                                                                                | -   | 96.2  | -    |      |
| 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> = 3.9 Ω, R <sub>L</sub> = 1.66 Ω,<br>I <sub>DS</sub> = 30 A | -   | 36    | -    | nS   |
| t <sub>r</sub>                           | Turn-on Rise Time              |                                                                                                                                | -   | 85    | -    |      |
| t <sub>d(off)</sub>                      | Turn-off Delay Time            |                                                                                                                                | -   | 182   | -    |      |
| t <sub>f</sub>                           | Turn-off Fall Time             |                                                                                                                                | -   | 113   | -    |      |
| Gate Charge Characteristics <sup>b</sup> |                                |                                                                                                                                |     |       |      |      |
| Q <sub>g</sub>                           | Total Gate Charge              | V <sub>DS</sub> = 50 V, V <sub>GS</sub> = 10 V,<br>I <sub>DS</sub> = 30 A                                                      | -   | 284   | -    | nC   |
| Q <sub>gs</sub>                          | Gate-Source Charge             |                                                                                                                                | -   | 73    | -    |      |
| Q <sub>gd</sub>                          | Gate-Drain Charge              |                                                                                                                                | -   | 85    | -    |      |

Notes :

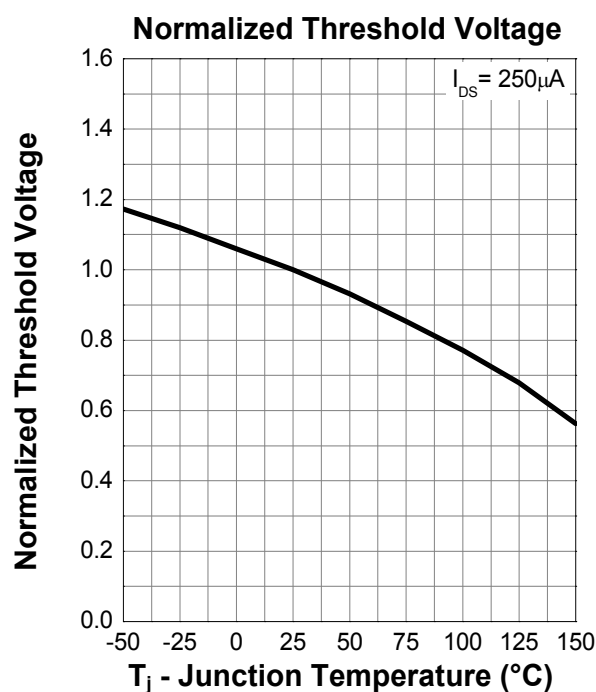
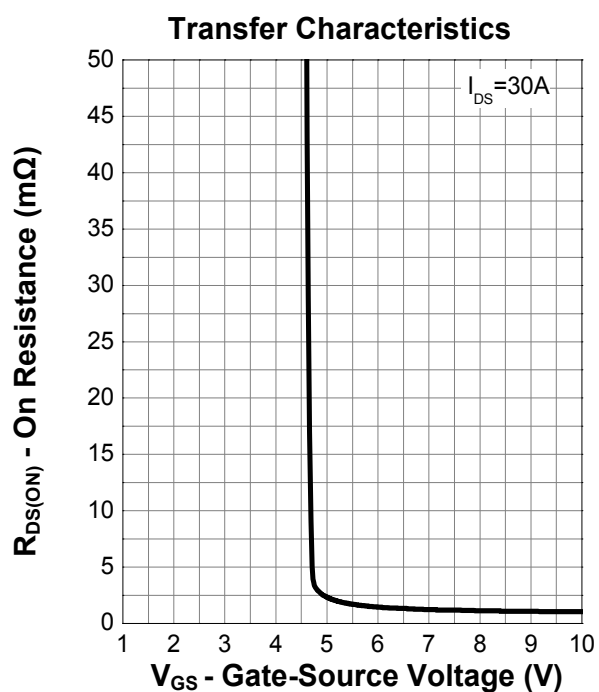
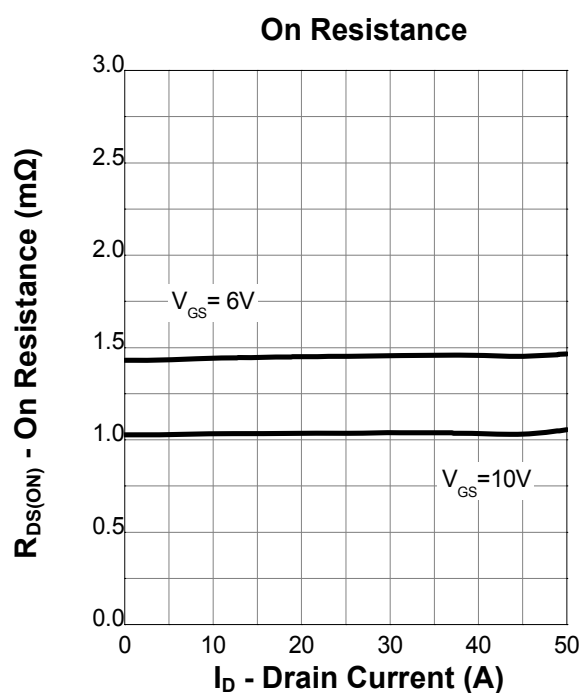
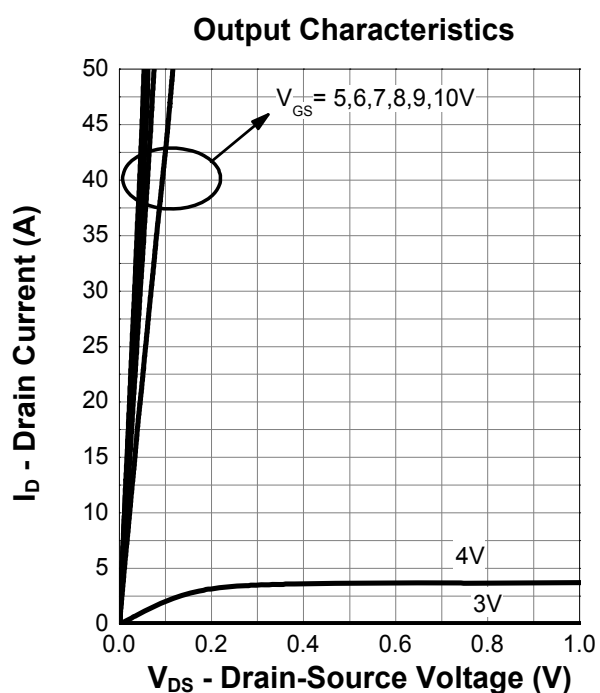
a : Pulse test ; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ 

b : Guaranteed by design, not subject to production testing

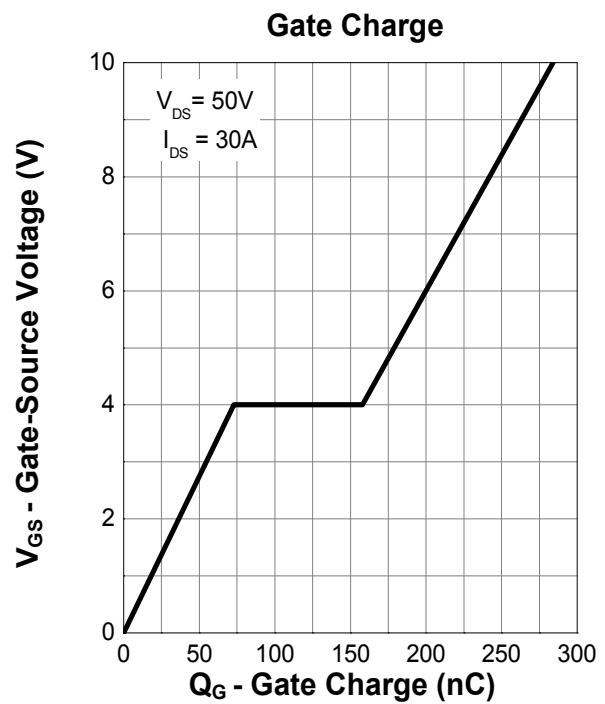
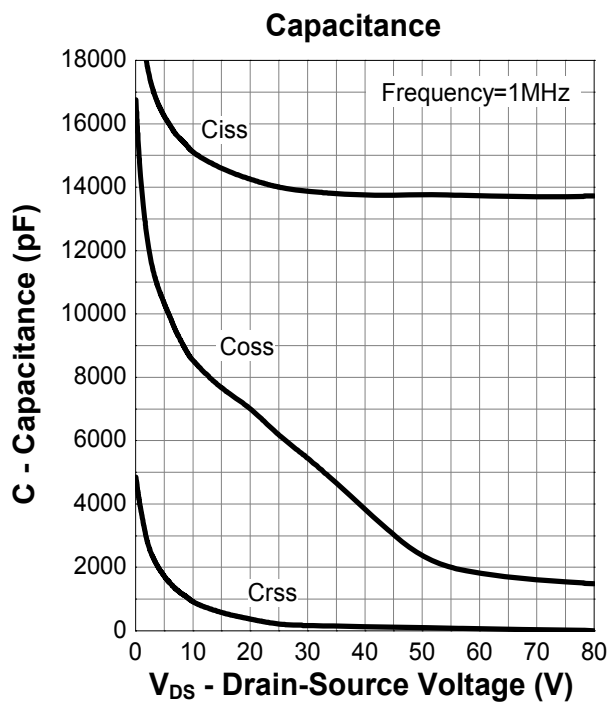
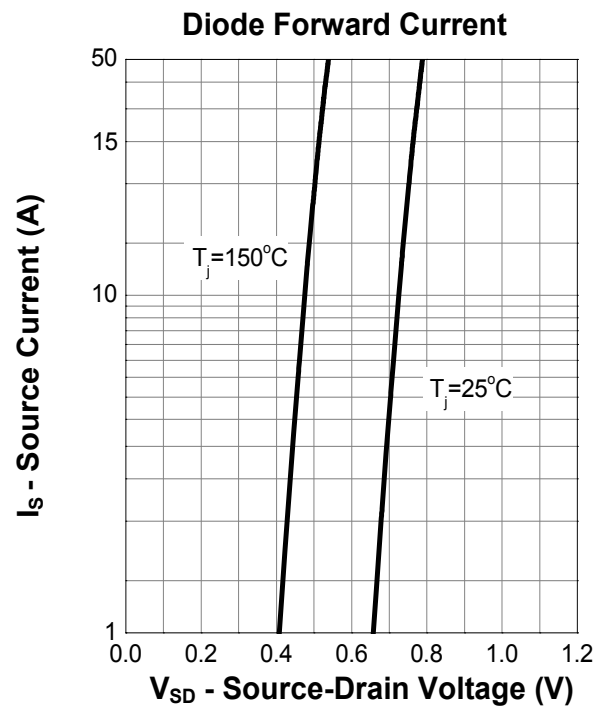
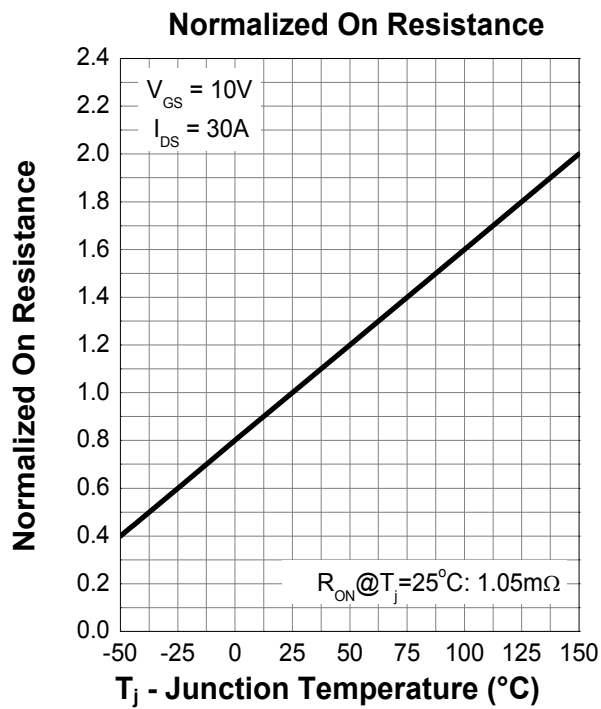
## Typical Characteristics



## Typical Characteristics (cont.)

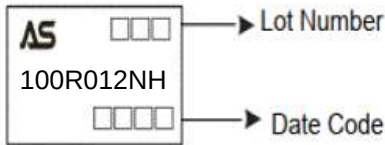


## Typical Characteristics (cont.)

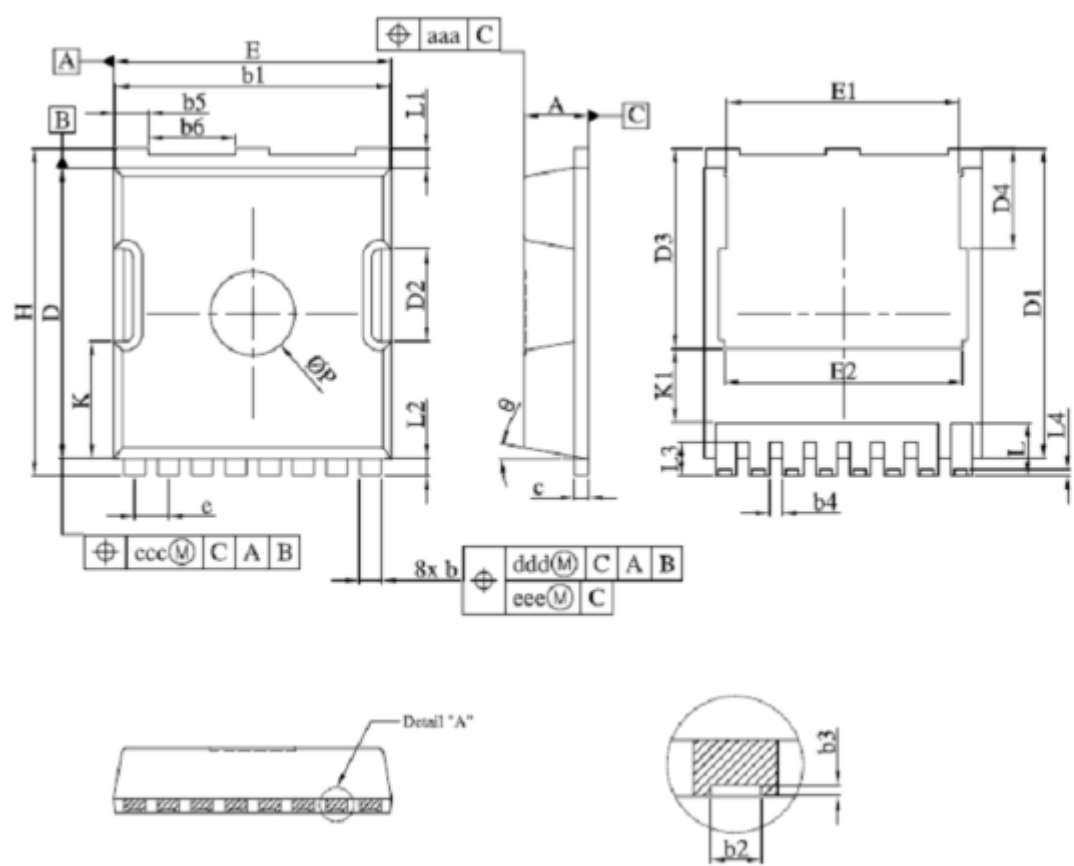


## Ordering and Marking Information

| Ordering Device No. | Marking   | Package | Packing   | Quantity  |
|---------------------|-----------|---------|-----------|-----------|
| ASDM100R012NHT-R    | 100R012NH | TOLL    | Tape&Reel | 2000/Reel |

| PACKAGE | MARKING                                                                                                                                                     |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TOLL    |  <p>AS    □□□ → Lot Number</p> <p>100R012NH</p> <p>□□□□ → Date Code</p> |

TOLL



| SYMBOL | COMMON     |         |       |
|--------|------------|---------|-------|
|        | MILLIMETER |         |       |
|        | MIN.       | NOMINAL | MAX.  |
| A      | 2.20       | 2.30    | 2.40  |
| b      | 0.70       | 0.80    | 0.90  |
| b1     | 9.70       | 9.80    | 9.90  |
| b2     | 0.95       | 0.45    | 0.55  |
| b3     | 0.05       | 0.100   | 0.35  |
| b4     | 0.90       | 0.40    | 0.50  |
| b5     | 1.10       | 1.20    | 1.30  |
| b6     | 3.00       | 3.10    | 3.20  |
| c      | 0.40       | 0.50    | 0.60  |
| D      | 10.28      | 10.38   | 10.55 |
| D1     | 10.98      | 11.08   | 11.18 |
| D2     | 3.20       | 3.30    | 3.40  |
| D3     | 7.00       | 7.15    | 7.30  |
| D4     | 3.44       | 3.59    | 3.74  |
| e      | 1.10       | 1.20    | 1.30  |
| E      | 9.80       | 9.90    | 10.00 |
| E1     | 8.20       | 8.30    | 8.40  |
| E2     | 8.35       | 8.50    | 8.65  |
| H      | 11.50      | 11.68   | 11.85 |
| K      | 4.08       | 4.18    | 4.28  |
| K1     | 2.45       | —       | —     |
| L      | 1.60       | 1.90    | 2.10  |
| L1     | 0.50       | 0.70    | 0.90  |
| L2     | 0.50       | 0.60    | 0.70  |
| L3     | 1.00       | 1.20    | 1.50  |
| L4     | 0.13       | 0.23    | 0.33  |
| P      | 2.85       | 3.00    | 3.15  |
| θ      | 10° REF    |         |       |
| aaa    | 0.20       |         |       |
| ccc    | 0.20       |         |       |
| ddd    | 0.25       |         |       |
| eee    | 0.20       |         |       |

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