

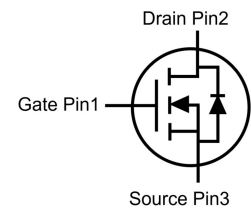
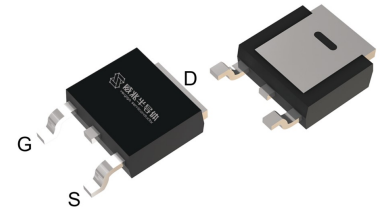
## Features

- N-Channel, 5V Logic Level Control
- Enhancement mode
- Very low on-resistance  $R_{DS(on)}$  @  $V_{GS}=4.5\text{ V}$
- Fast Switching
- 100% Avalanche test
- Pb-free lead plating; RoHS compliant


**Halogen-Free**

| Part ID  | Package Type | Marking | Packing      |
|----------|--------------|---------|--------------|
| VS3618AD | TO-252       | 3618AD  | 2500pcs/Reel |

|                                       |     |            |
|---------------------------------------|-----|------------|
| $V_{DS}$                              | 30  | V          |
| $R_{DS(on),TYP@ V_{GS}=10\text{ V}}$  | 5.8 | m $\Omega$ |
| $R_{DS(on),TYP@ V_{GS}=4.5\text{ V}}$ | 9   | m $\Omega$ |
| $I_D$                                 | 70  | A          |

**TO-252**


## Maximum ratings, at $T_A = 25^\circ\text{C}$ , unless otherwise specified

| Symbol         | Parameter                                      | Rating                    | Unit             |
|----------------|--|---------------------------|------------------|
| $V_{(BR)DSS}$  | Drain-Source breakdown voltage                 | 30                        | V                |
| $V_{GS}$       | Gate-Source voltage                            | $\pm 20$                  | V                |
| $I_S$          | Diode continuous forward current               | $T_C = 25^\circ\text{C}$  | 70<br>A          |
| $I_D$          | Continuous drain current @ $V_{GS}=10\text{V}$ | $T_C = 25^\circ\text{C}$  | 70<br>A          |
|                |  | $T_C = 100^\circ\text{C}$ | 50<br>A          |
| $I_{DSM}$      | Continuous drain current @ $V_{GS}=10\text{V}$ | $T_A = 25^\circ\text{C}$  | 11<br>A          |
|                |  | $T_A = 70^\circ\text{C}$  | 9<br>A           |
| $I_{DM}$       | Pulse drain current tested ①                   | $T_C = 25^\circ\text{C}$  | 280<br>A         |
| EAS            | Avalanche energy, single pulsed ②              | 36                        | mJ               |
| $P_D$          | Maximum power dissipation                      | $T_C = 25^\circ\text{C}$  | 48<br>W          |
| $P_{DSM}$      | Maximum power dissipation ③                    | $T_A = 25^\circ\text{C}$  | 1.3<br>W         |
| $T_{STG}, T_J$ | Storage and Junction Temperature Range         | -55 to 175                | $^\circ\text{C}$ |

## Thermal Characteristics

| Symbol          | Parameter                               | Typical | Unit               |
|-----------------|---|---------|--------------------|
| $R_{\theta JC}$ | Thermal Resistance, Junction-to-Case    | 3.1     | $^\circ\text{C/W}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient | 100     | $^\circ\text{C/W}$ |

**Typical Characteristics**

| Symbol   | Parameter  | Condition  | Min. | Typ. | Max. | Unit |
|--|--|--|------|------|------|------|
| <b>Static Electrical Characteristics @ T<sub>J</sub>=25°C (unless otherwise stated)</b>    |  |  |      |      |      |      |
| V <sub>(BR)DSS</sub>   | Drain-Source Breakdown Voltage                         | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA   | 30   | --   | --   | V    |
| I <sub>DSS</sub>   | Zero Gate Voltage Drain Current                        | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V  | --   | --   | 0.1  | μA   |
|  | Zero Gate Voltage Drain Current(T <sub>J</sub> =125°C) | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V  | --   | --   | 100  | μA   |
| I <sub>GSS</sub>   | Gate-Body Leakage Current                              | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V   | --   | --   | ±100 | nA   |
| V <sub>GS(TH)</sub>  | Gate Threshold Voltage                                 | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                       | 1.3  | 1.8  | 2.4  | V    |
| R <sub>DS(ON)</sub>  | Drain-Source On-State Resistance <sup>④</sup>          | V <sub>GS</sub> =10V, I <sub>D</sub> =20A  | --   | 5.8  | 7    | mΩ   |
| R <sub>DS(ON)</sub>  | Drain-Source On-State Resistance <sup>④</sup>          | V <sub>GS</sub> =4.5V, I <sub>D</sub> =15A   | --   | 9    | 11   | mΩ   |
| <b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b> |  |  |      |      |      |      |
| C <sub>iss</sub>   | Input Capacitance                                      | V <sub>DS</sub> =15V, V <sub>GS</sub> =0V,<br>f=1MHz   | 900  | 1110 | 1300 | pF   |
| C <sub>oss</sub>   | Output Capacitance                                     |  | 100  | 180  | 280  | pF   |
| C <sub>rss</sub>   | Reverse Transfer Capacitance                           |  | 80   | 130  | 200  | pF   |
| R <sub>g</sub>   | Gate Resistance  | f=1MHz   | --   | 1.9  | --   | Ω    |
| Q <sub>g</sub> (10V)   | Total Gate Charge                                      | V <sub>DS</sub> =15V, I <sub>D</sub> =15A,<br>V <sub>GS</sub> =10V                             | --   | 23   | --   | nC   |
| Q <sub>g</sub> (4.5V)  | Total Gate Charge                                      |  | --   | 17   | --   | nC   |
| Q <sub>gs</sub>  | Gate-Source Charge                                     |  | --   | 6.2  | --   | nC   |
| Q <sub>gd</sub>  | Gate-Drain Charge                                      |  | --   | 8.9  | --   | nC   |
| <b>Switching Characteristics</b>   |  |  |      |      |      |      |
| t <sub>d(on)</sub>   | Turn-on Delay Time                                     | V <sub>DD</sub> =15V,<br>I <sub>D</sub> =15A,<br>R <sub>G</sub> =6.8Ω,<br>V <sub>GS</sub> =10V | --   | 14   | --   | ns   |
| t <sub>r</sub>   | Turn-on Rise Time                                      |  | --   | 27   | --   | ns   |
| t <sub>d(off)</sub>  | Turn-Off Delay Time                                    |  | --   | 65   | --   | ns   |
| t <sub>f</sub>   | Turn-Off Fall Time                                     |  | --   | 19   | --   | ns   |
| <b>Source- Drain Diode Characteristics@ T<sub>J</sub> = 25°C (unless otherwise stated)</b> |  |  |      |      |      |      |
| V <sub>SD</sub>  | Forward on voltage                                     | I <sub>SD</sub> =20A, V <sub>GS</sub> =0V  | --   | 0.85 | 1.2  | V    |
| t <sub>rr</sub>  | Reverse Recovery Time                                  | T <sub>J</sub> =25°C, I <sub>sd</sub> =15A,<br>V <sub>GS</sub> =0V                             | --   | 31   | --   | ns   |
| Q <sub>rr</sub>  | Reverse Recovery Charge                                | di/dt=100A/μs  | --   | 95   | --   | nC   |

**NOTE:**

- ① Repetitive rating; pulse width limited by max junction temperature.
- ② Limited by T<sub>Jmax</sub>, starting T<sub>J</sub> = 25°C, L = 0.5mH, R<sub>G</sub> = 25Ω, I<sub>AS</sub> = 10A, V<sub>GS</sub> = 10V. Part not recommended for use above this value
- ③ The power dissipation P<sub>DSM</sub> is based on R<sub>θJA</sub> and the maximum allowed junction temperature of 150°C.
- ④ Pulse width ≤ 300μs; duty cycles ≤ 2%.

Typical Characteristics

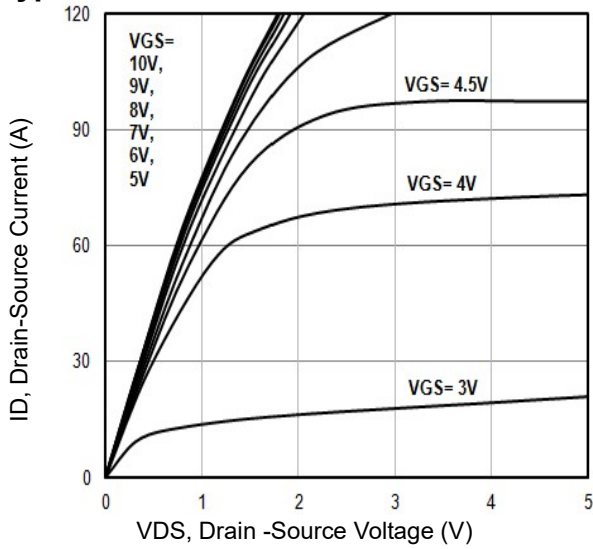


Fig1. Typical Output Characteristics

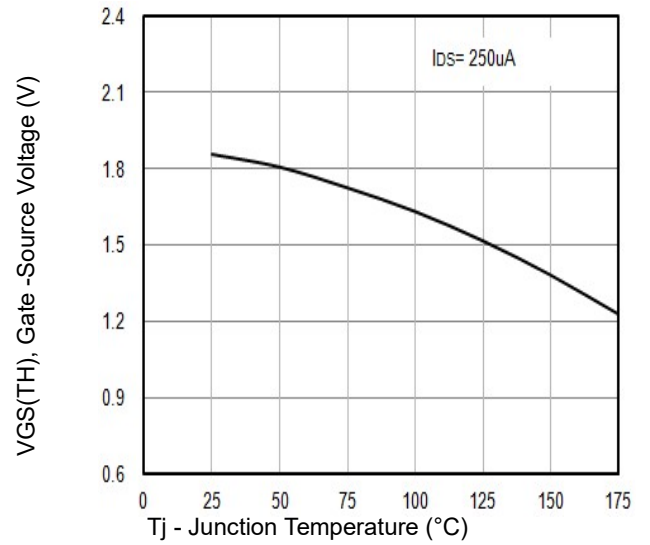


Fig2.  $V_{GS(TH)}$  Gate -Source Voltage Vs.  $T_j$

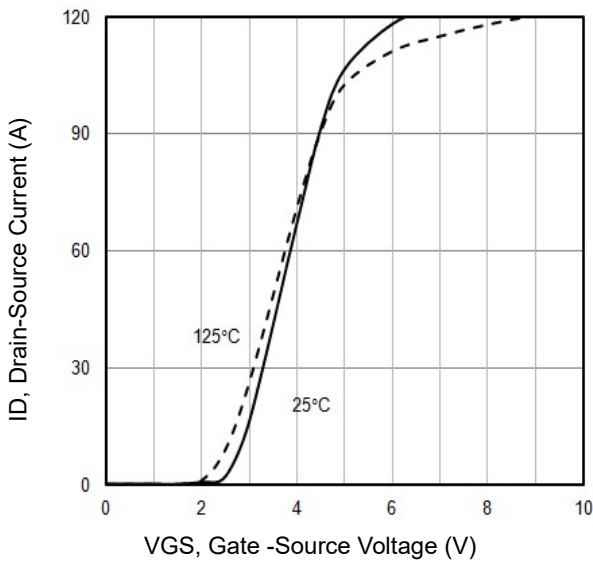


Fig3. Typical Transfer Characteristics

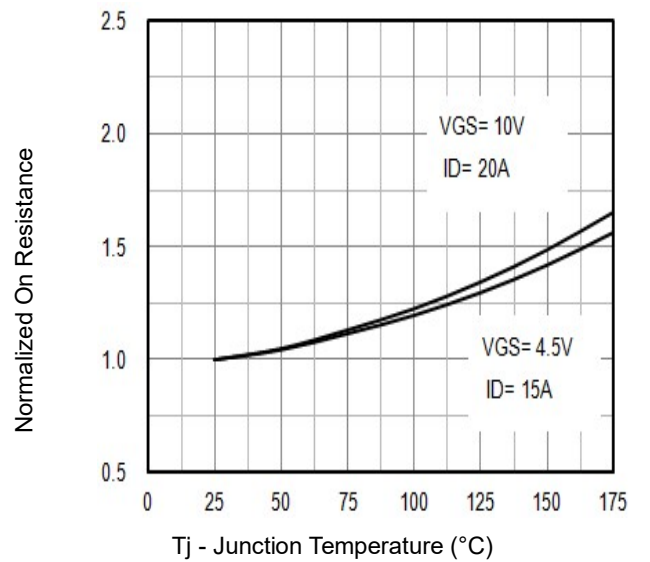


Fig4. Normalized On-Resistance Vs.  $T_j$

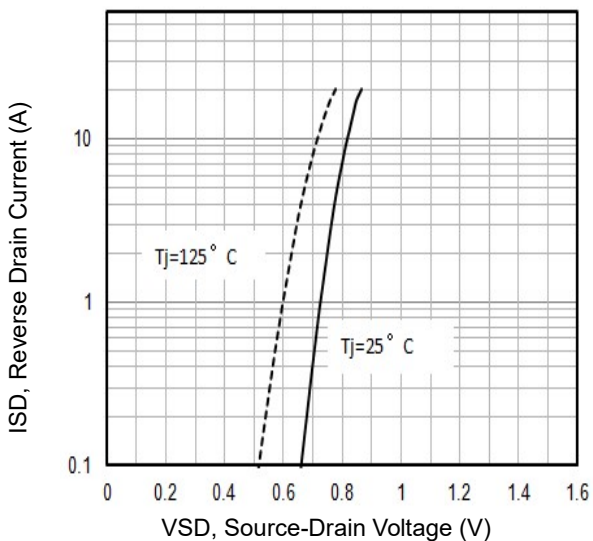


Fig5. Typical Source-Drain Diode Forward Voltage

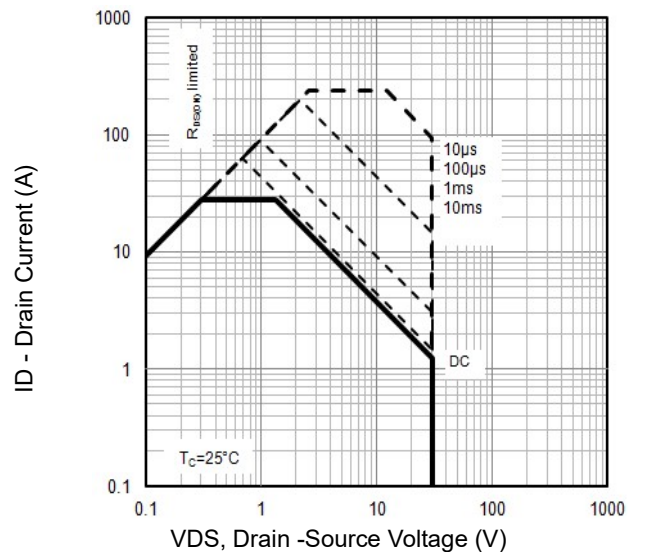


Fig6. Maximum Safe Operating Area

Typical Characteristics

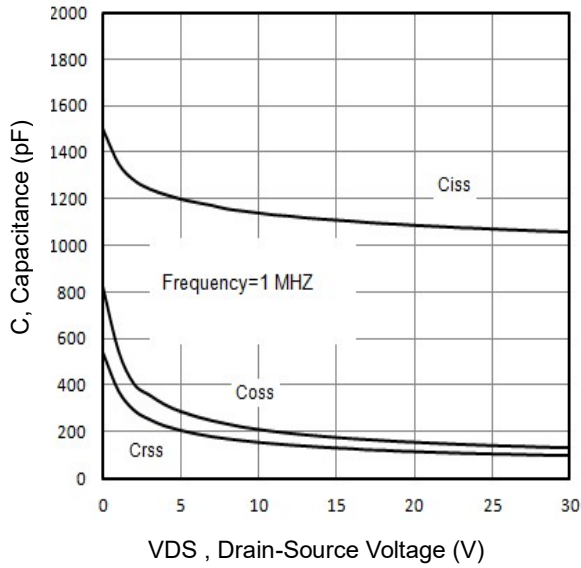


Fig7. Typical Capacitance Vs.Drain-Source Voltage

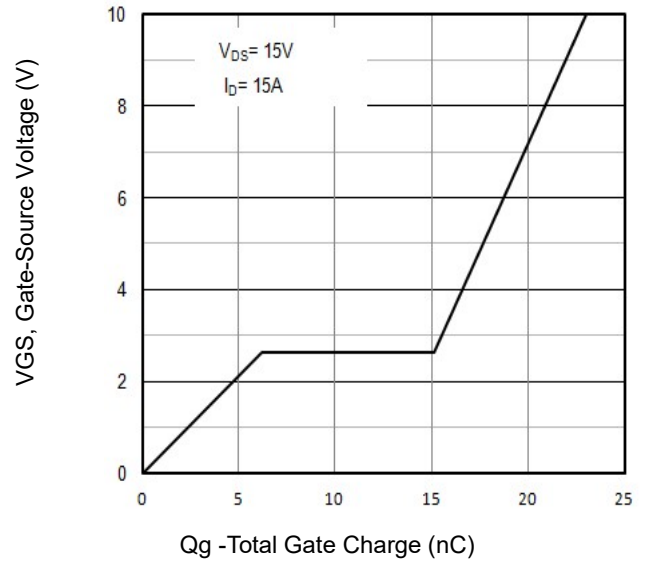


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

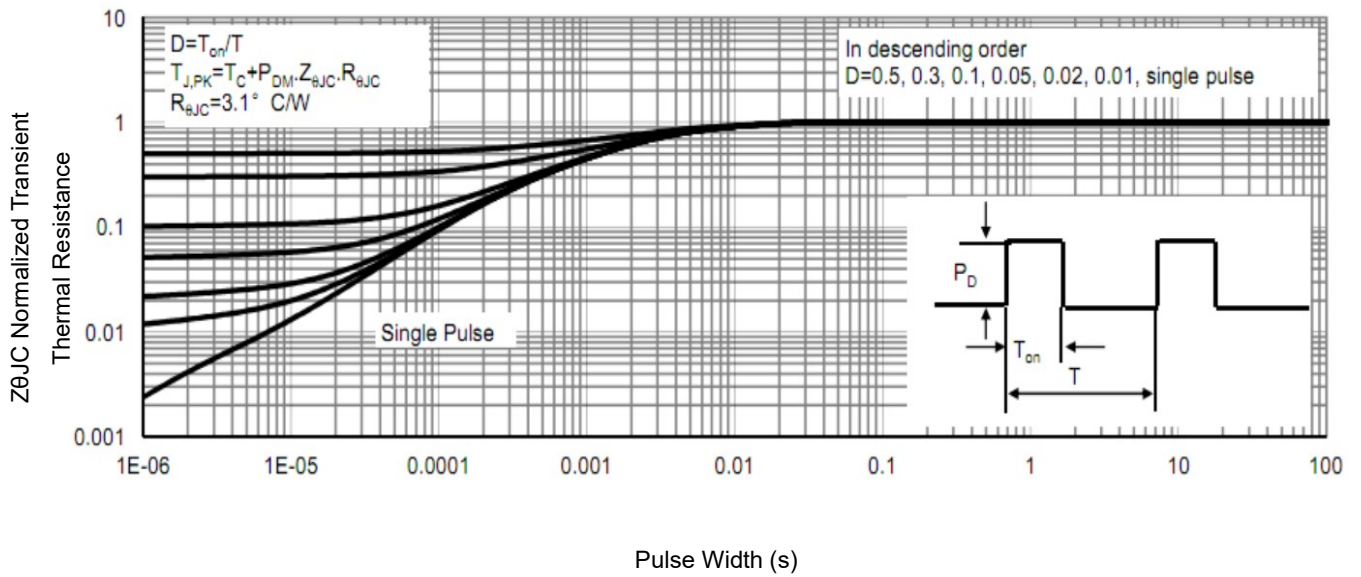


Fig9. Normalized Maximum Transient Thermal Impedance

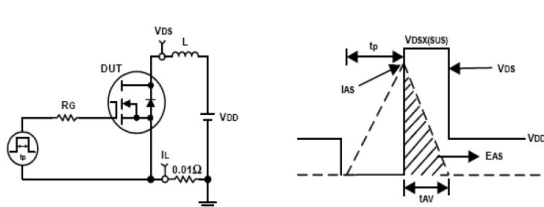


Fig10. Unclamped Inductive Test Circuit and waveforms

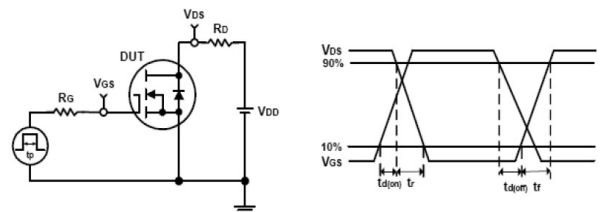
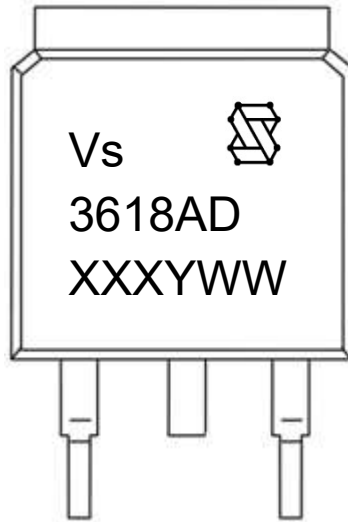


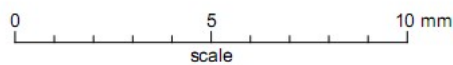
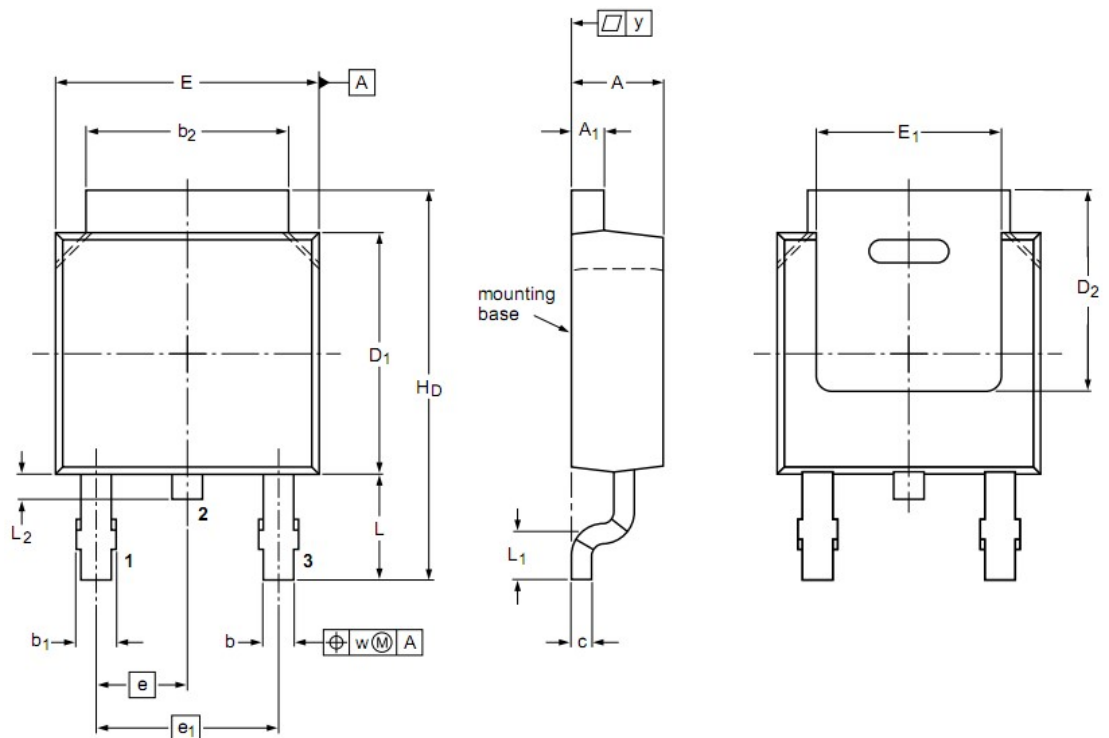
Fig11. Switching Time Test Circuit and waveforms

**Marking Information**



- 1st line: Vergiga Code (Vs), Vergiga Logo
- 2nd line: Part Number (3618AD)
- 3rd line: Date code (XXXYWW)
  - XXX: Wafer Lot Number
  - Y: Year Code , refer to table below
  - WW: Week Code (01 to 53)

| Code | C    | D    | E    | F    | G    | H    | J    | K    | L    | M    | N    | P    | Q    | R    | S    | T    |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Year | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |

**TO-252 Package Outline Data**


| Symbol               | Dimensions (unit: mm) |       |       |
|----------------------|-----------------------|-------|-------|
|                      | Min                   | Typ   | Max   |
| <b>A</b>             | 2.20                  | 2.30  | 2.38  |
| <b>A<sub>1</sub></b> | 0.46                  | 0.50  | 0.63  |
| <b>b</b>             | 0.64                  | 0.76  | 0.89  |
| <b>b<sub>1</sub></b> | 0.77                  | 0.85  | 1.14  |
| <b>b<sub>2</sub></b> | 5.00                  | 5.33  | 5.46  |
| <b>c</b>             | 0.458                 | 0.508 | 0.558 |
| <b>D<sub>1</sub></b> | 5.98                  | 6.10  | 6.223 |
| <b>D<sub>2</sub></b> | 5.21                  | --    | --    |
| <b>E</b>             | 6.40                  | 6.60  | 6.731 |
| <b>E<sub>1</sub></b> | 4.40                  | --    | --    |
| <b>e</b>             | 2.286 BSC             |       |       |
| <b>e<sub>1</sub></b> | --                    | 4.57  | --    |
| <b>H<sub>D</sub></b> | 9.40                  | 10.00 | 10.40 |
| <b>L</b>             | 2.743 REF             |       |       |
| <b>L<sub>1</sub></b> | 1.40                  | 1.52  | 1.77  |
| <b>L<sub>2</sub></b> | 0.50                  | 0.80  | 1.01  |
| <b>w</b>             | --                    | 0.20  | --    |
| <b>y</b>             | --                    | --    | 0.20  |

**Notes:**

1. Refer to JEDEC TO-252 variation AA
2. Dimension "E" does NOT include mold flash, protrusions or gate burrs. Mold flash, protrusions or gate burrs shall not exceed 0.1524mm per side.
3. Dimension "D1" does NOT include interlead flash or protrusion. Interlead flash or protrusion shall not exceed 0.1524mm per end.

**Customer Service**
**Sales and Service:**
[sales@vgsemi.com](mailto:sales@vgsemi.com)
**Vergiga Semiconductor CO., LTD**
**TEL:** (86-755) -26902410

**FAX:** (86-755) -26907027

**WEB:** [www.vgsemi.com](http://www.vgsemi.com)

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [MOSFET](#) category:*

*Click to view products by [Vanguard](#) manufacturer:*

Other Similar products are found below :

[614233C](#) [648584F](#) [IRFD120](#) [IRFF430](#) [JANTX2N5237](#) [2N7000](#) [FCA20N60\\_F109](#) [FDZ595PZ](#) [AOD464](#) [2SK2267\(Q\)](#) [2SK2545\(Q,T\)](#)  
[405094E](#) [423220D](#) [MIC4420CM-TR](#) [VN1206L](#) [614234A](#) [715780A](#) [SSM6J414TU,LF\(T](#) [751625C](#) [PSMN4R2-30MLD](#)  
[TK31J60W5,S1VQ\(O](#) [2SK2614\(TE16L1,Q\)](#) [DMN1017UCP3-7](#) [EFC2J004NUZTDG](#) [FCAB21350L1](#) [P85W28HP2F-7071](#) [DMN1053UCP4-7](#)  
[NTE2384](#) [NTE2969](#) [NTE6400A](#) [DMN2080UCB4-7](#) [DMN61D9UWQ-13](#) [US6M2GTR](#) [DMN31D5UDJ-7](#) [SSM6P54TU,LF](#) [DMP22D4UFO-](#)  
[7B](#) [IPS60R3K4CEAKMA1](#) [DMN1006UCA6-7](#) [DMN16M9UCA6-7](#) [STF5N65M6](#) [STU5N65M6](#) [C3M0021120D](#) [DMN13M9UCA6-7](#)  
[BSS340NWH6327XTSA1](#) [MCM3400A-TP](#) [DMTH10H4M6SPS-13](#) [IRF40SC240ARMA1](#) [IPS60R1K0PFD7SAKMA1](#)  
[IPS60R360PFD7SAKMA1](#) [IPS60R600PFD7SAKMA1](#)