

## Features

- 30V/14A,  
 $R_{DS(ON)} = 7m\Omega(Typ.)@V_{GS}=10V$   
 $R_{DS(ON)} = 10m\Omega(Typ.)@V_{GS}=4.5V$
- Low  $R_{DS(ON)}$
- Super High Dense Cell Design
- Reliable and Rugged

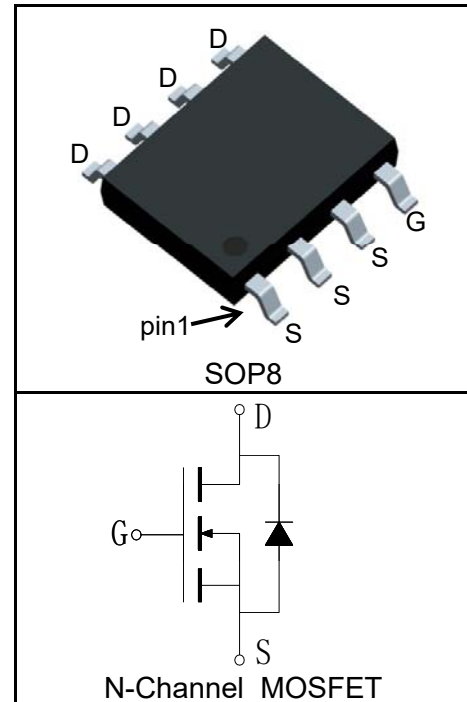
## Applications

- Power Management
- Battery Protection



Halogen-Free

## Pin Description



## Absolute Maximum Ratings

| Symbol                                                       | Parameter                                       |                      | Rating     | Unit |
|--------------------------------------------------------------|-------------------------------------------------|----------------------|------------|------|
| Common Ratings (T <sub>A</sub> =25°C Unless Otherwise Noted) |                                                 |                      |            |      |
| V <sub>DSS</sub>                                             | Drain-Source Voltage                            |                      | 30         | V    |
| V <sub>GSS</sub>                                             | Gate-Source Voltage                             |                      | ±20        |      |
| T <sub>J</sub>                                               | Maximum Junction Temperature                    |                      | 150        | °C   |
| T <sub>STG</sub>                                             | Storage Temperature Range                       |                      | -55 to 150 | °C   |
| I <sub>S</sub>                                               | Diode Continuous Forward Current                | T <sub>A</sub> =25°C | 3.1        | A    |
| Mounted on Large Heat Sink                                   |                                                 |                      |            |      |
| I <sub>DP</sub> <sup>①</sup>                                 | 300μs Pulse Drain Current Tested                | T <sub>A</sub> =25°C | 56         | A    |
| I <sub>D</sub> <sup>②</sup>                                  | Continuous Drain Current(V <sub>GS</sub> =4.5V) | T <sub>A</sub> =25°C | 14         | A    |
|                                                              |                                                 | T <sub>A</sub> =70°C | 11         |      |
| P <sub>D</sub>                                               | Maximum Power Dissipation                       | T <sub>A</sub> =25°C | 2.5        | W    |
|                                                              |                                                 | T <sub>A</sub> =70°C | 1.6        |      |
| R <sub>θJC</sub>                                             | Thermal Resistance-Junction to Case             |                      | -          | °C/W |
| R <sub>θJA</sub> <sup>③</sup>                                | Thermal Resistance-Junction to Ambient          |                      | 50         | °C/W |
| Drain-Source Avalanche Ratings                               |                                                 |                      |            |      |
| E <sub>AS</sub> <sup>④</sup>                                 | Avalanche Energy, Single Pulsed                 |                      | 25         | mJ   |

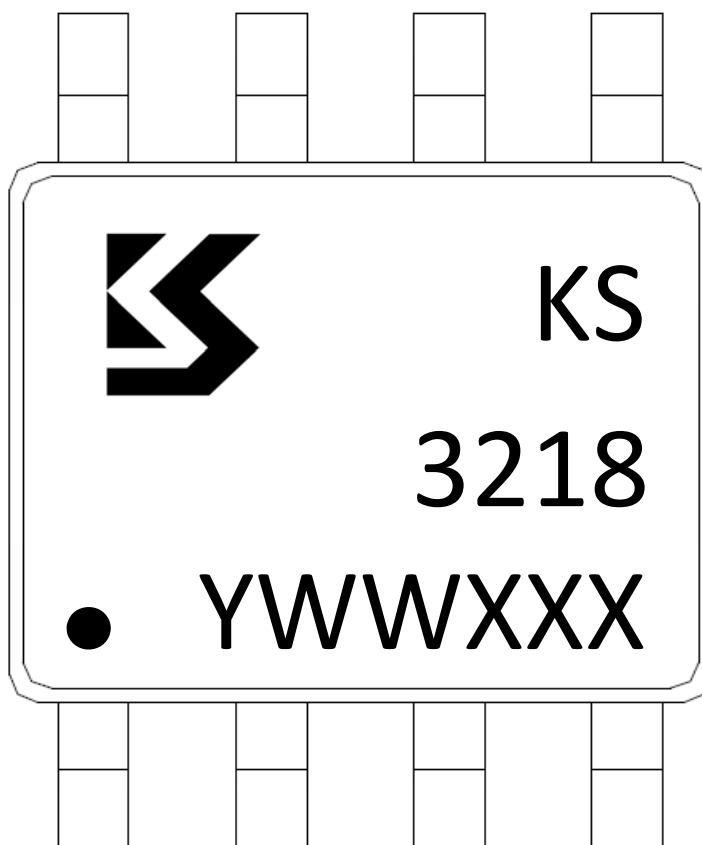
**Electrical Characteristics** ( $T_A=25^{\circ}\text{C}$  Unless Otherwise Noted)

| Symbol                                   | Parameter                        | Test Condition                                                                           | KS3218HA |      |      | Unit |
|------------------------------------------|----------------------------------|------------------------------------------------------------------------------------------|----------|------|------|------|
|                                          |                                  |                                                                                          | Min.     | Typ. | Max. |      |
| Static Characteristics                   |                                  |                                                                                          |          |      |      |      |
| BV <sub>DSS</sub>                        | Drain-Source Breakdown Voltage   | V <sub>GS</sub> =0V, I <sub>DS</sub> =250μA                                              | 30       |      |      | V    |
| I <sub>DSS</sub>                         | Zero Gate Voltage Drain Current  | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V                                                |          |      | 1    | μA   |
|                                          |                                  | T <sub>J</sub> =125°C                                                                    |          |      | 30   |      |
| V <sub>GS(th)</sub>                      | Gate Threshold Voltage           | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250μA                                | 1.3      | 1.9  | 2.3  | V    |
| I <sub>GSS</sub>                         | Gate Leakage Current             | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V                                               |          |      | ±100 | nA   |
| R <sub>DS(ON)</sub> <sup>⑤</sup>         | Drain-Source On-state Resistance | V <sub>GS</sub> =10V, I <sub>DS</sub> =10A                                               |          | 7    | 9    | mΩ   |
|                                          |                                  | V <sub>GS</sub> =4.5V, I <sub>DS</sub> =8A                                               |          | 10   | 13   | mΩ   |
| Diode Characteristics                    |                                  |                                                                                          |          |      |      |      |
| V <sub>SD</sub> <sup>⑤</sup>             | Diode Forward Voltage            | I <sub>SD</sub> =10A, V <sub>GS</sub> =0V                                                |          | 0.85 | 1.2  | V    |
| t <sub>rr</sub>                          | Reverse Recovery Time            | I <sub>SD</sub> =10A, dI <sub>SD</sub> /dt=100A/μs                                       |          | 11   |      | ns   |
| Q <sub>rr</sub>                          | Reverse Recovery Charge          |                                                                                          |          | 15   |      | nC   |
| Dynamic Characteristics <sup>⑥</sup>     |                                  |                                                                                          |          |      |      |      |
| R <sub>G</sub>                           | Gate Resistance                  | V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz                                         |          | 4.5  |      | Ω    |
| C <sub>iss</sub>                         | Input Capacitance                | V <sub>GS</sub> =0V,<br>V <sub>DS</sub> =15V,<br>Frequency=1.0MHz                        |          | 1130 |      | pF   |
| C <sub>oss</sub>                         | Output Capacitance               |                                                                                          |          | 180  |      |      |
| C <sub>rss</sub>                         | Reverse Transfer Capacitance     |                                                                                          |          | 135  |      |      |
| t <sub>d(ON)</sub>                       | Turn-on Delay Time               | V <sub>DD</sub> =15V, I <sub>DS</sub> =10A,<br>V <sub>GEN</sub> =10V, R <sub>G</sub> =6Ω |          | 9    |      | ns   |
| t <sub>r</sub>                           | Turn-on Rise Time                |                                                                                          |          | 14   |      |      |
| t <sub>d(OFF)</sub>                      | Turn-off Delay Time              |                                                                                          |          | 19   |      |      |
| t <sub>f</sub>                           | Turn-off Fall Time               |                                                                                          |          | 6    |      |      |
| Gate Charge Characteristics <sup>⑥</sup> |                                  |                                                                                          |          |      |      |      |
| Q <sub>g</sub>                           | Total Gate Charge                | V <sub>DS</sub> =15V, V <sub>GS</sub> =10V,<br>I <sub>DS</sub> =10A                      |          | 22   |      | nC   |
| Q <sub>gs</sub>                          | Gate-Source Charge               |                                                                                          |          | 4.7  |      |      |
| Q <sub>gd</sub>                          | Gate-Drain Charge                |                                                                                          |          | 7    |      |      |

- Notes:
- ① Pulse width limited by safe operating area.
  - ② Calculated continuous current based on maximum allowable junction temperature.
  - ③ When mounted on 1 inch square copper board,  $t \leq 10\text{sec}$ . The value in any given application depends on the user's specific board design.
  - ④ Limited by  $T_{Jmax}$ , starting  $T_J = 25^{\circ}\text{C}$ ,  $L = 0.5\text{mH}$ ,  $R_G = 25\Omega$ ,  $I_{AS} = 10A$ ,  $V_{GS} = 10V$ .
  - ⑤ Pulse test; Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
  - ⑥ Guaranteed by design, not subject to production testing.

## Ordering and Marking Information

| Device   | Package | Packaging | Quantity | Reel Size | Tape width |
|----------|---------|-----------|----------|-----------|------------|
| KS3218HA | SOP8    | Tape&Reel | 3000     | 13"       | 12mm       |

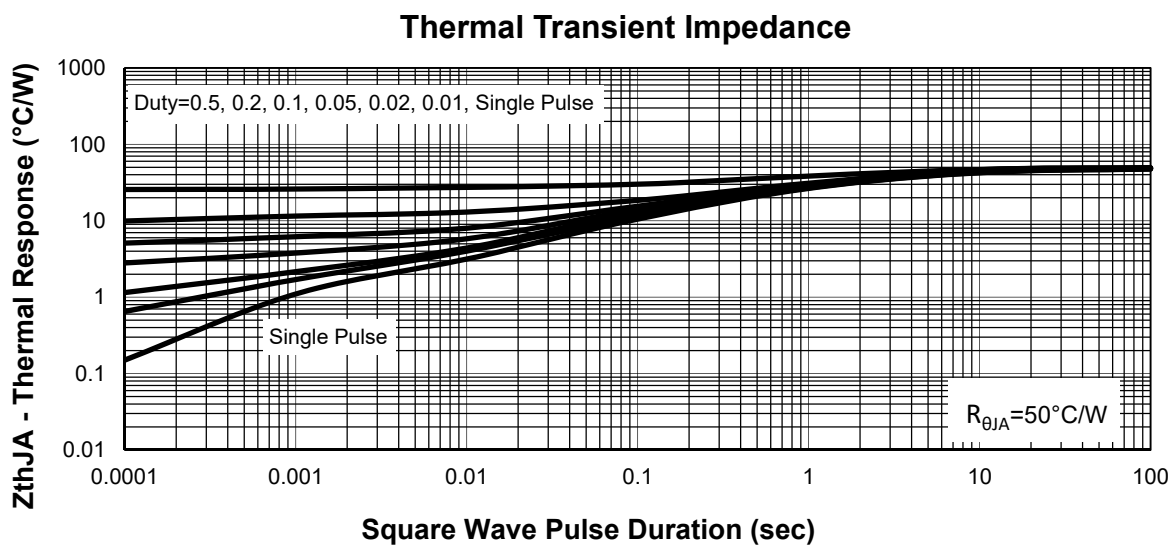
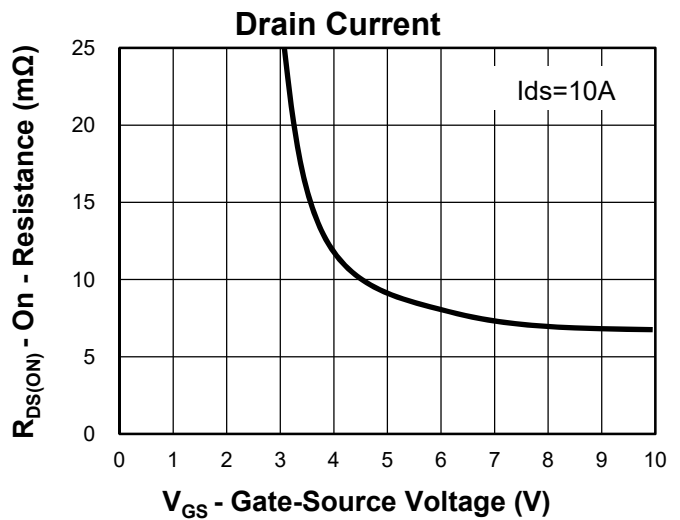
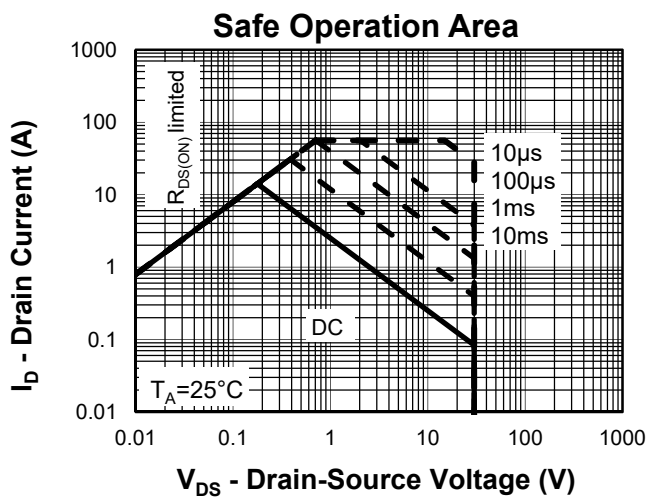
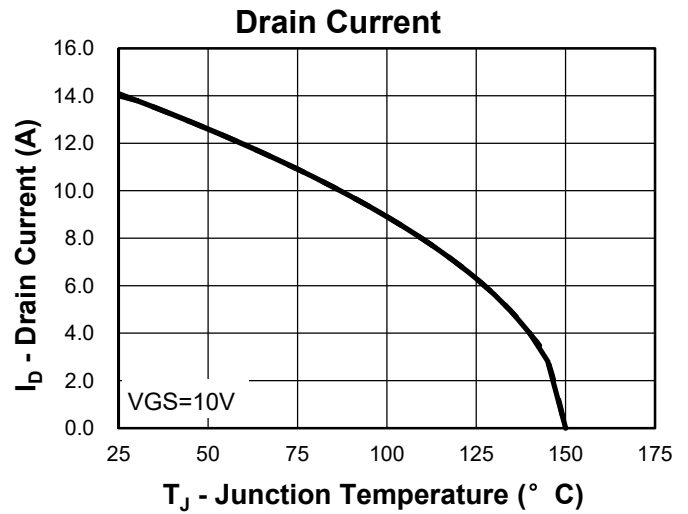
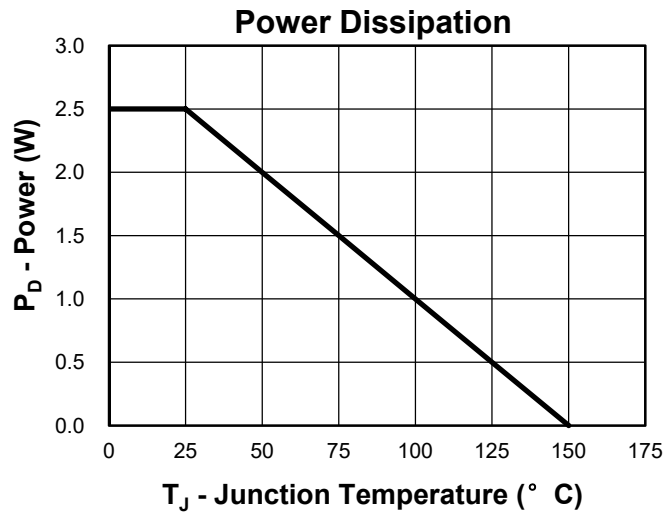


Y        =Year,2017-A,2018-B,etc.

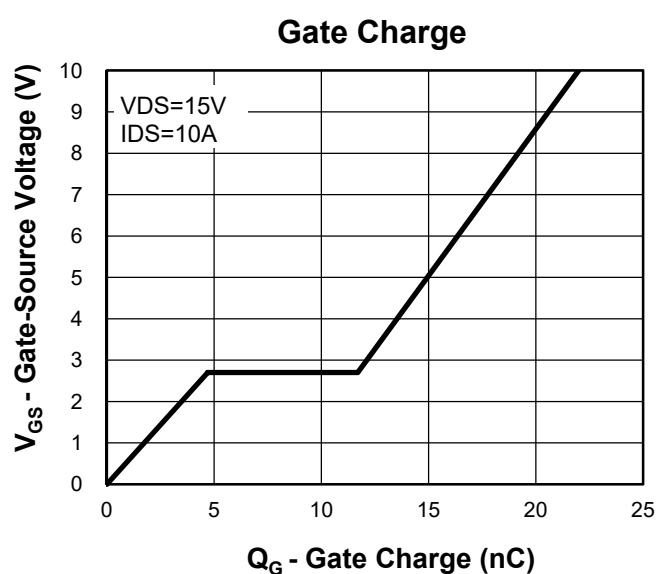
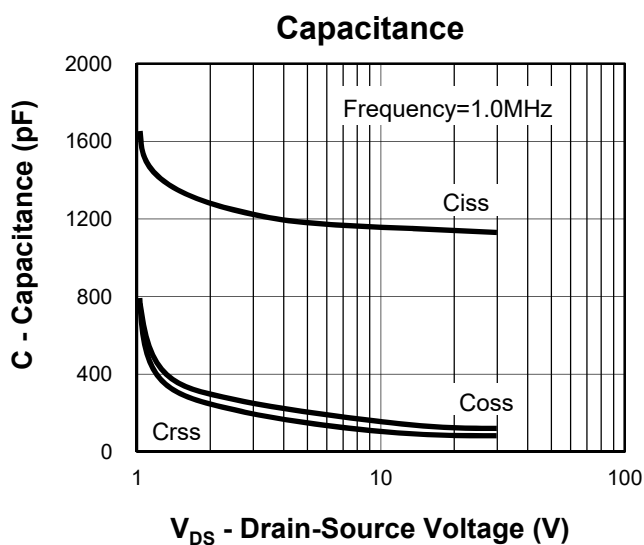
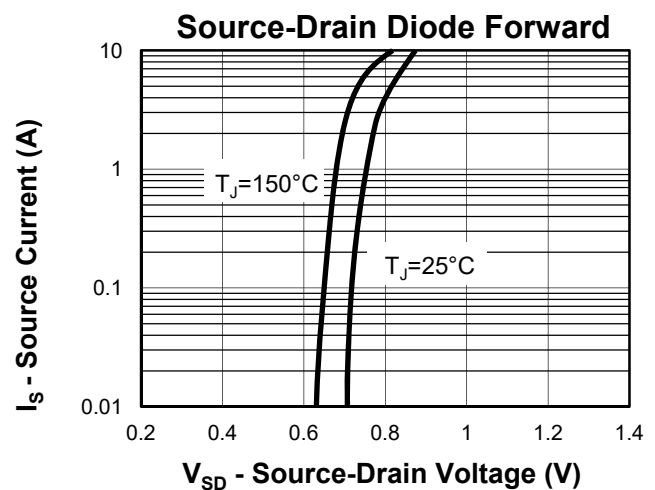
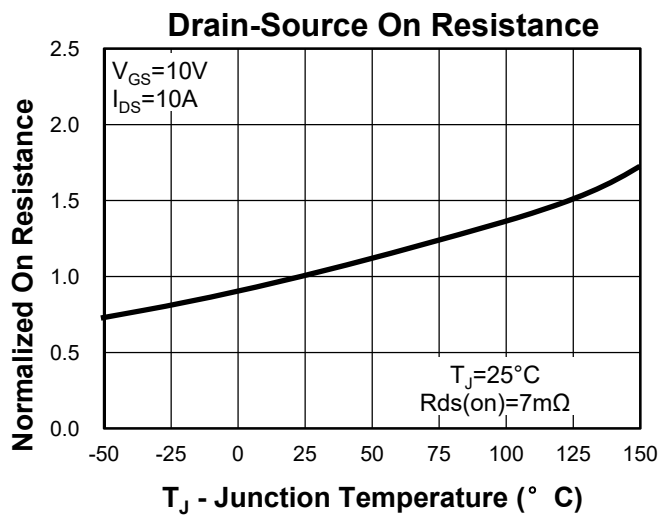
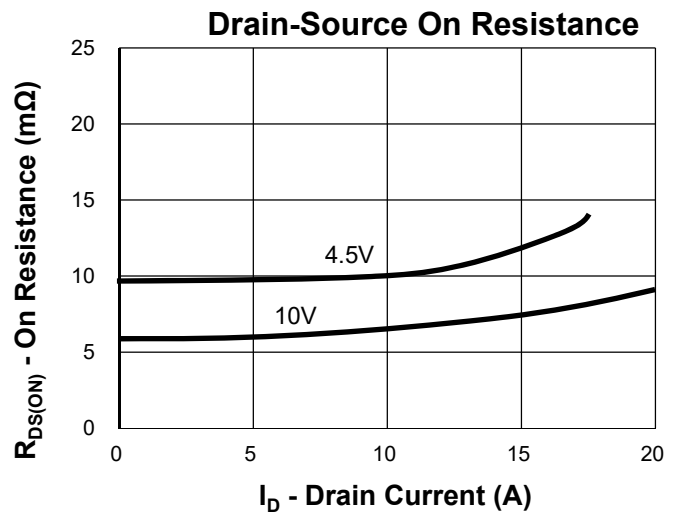
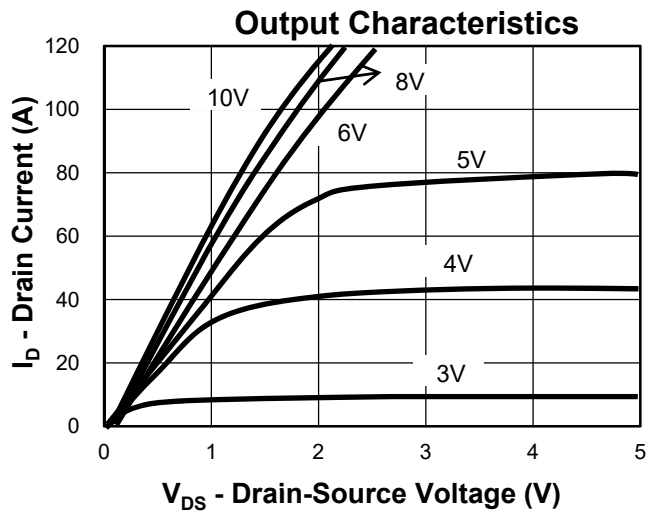
WW      =Week.

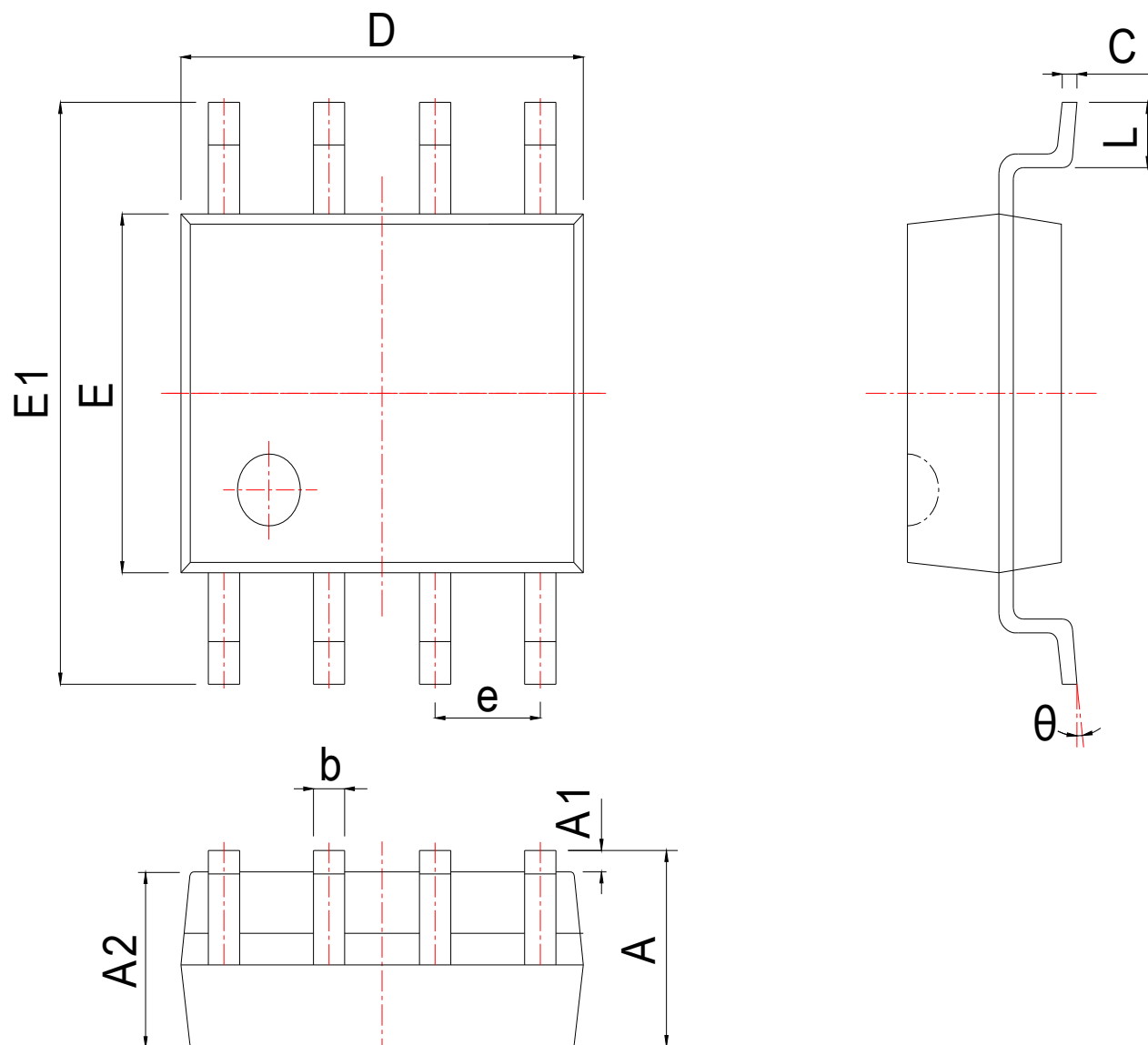
XXX     =Lot number.

## Typical Characteristics



## Typical Characteristics



**Package Information**
**SOP8**


| SYMBOL | MM        |       |       | INCH      |       |       |
|--------|-----------|-------|-------|-----------|-------|-------|
|        | MIN       | NOM   | MAX   | MIN       | NOM   | MAX   |
| A      | 1.300     | 1.525 | 1.750 | 0.051     | 0.060 | 0.069 |
| A1     | 0.050     | 0.150 | 0.250 | 0.002     | 0.006 | 0.010 |
| A2     | 1.350     | 1.450 | 1.550 | 0.053     | 0.057 | 0.061 |
| b      | 0.330     | 0.420 | 0.510 | 0.013     | 0.017 | 0.020 |
| c      | 0.170     | 0.210 | 0.250 | 0.007     | 0.008 | 0.010 |
| D      | 4.700     | 4.900 | 5.100 | 0.185     | 0.193 | 0.201 |
| E      | 3.800     | 3.900 | 4.000 | 0.150     | 0.154 | 0.157 |
| E1     | 5.800     | 6.000 | 6.200 | 0.228     | 0.236 | 0.244 |
| e      | 1.270 BSC |       |       | 0.050 BSC |       |       |
| L      | 0.400     | 0.835 | 1.270 | 0.016     | 0.033 | 0.050 |
| θ      | 0°        |       |       | 8°        |       |       |

### Avalanche Test Circuit and Waveforms



### Switching Time Test Circuit and Waveforms



### Diode Recovery Test Circuit and Waveforms



### Gate Charge Test Circuit and Waveform



### Customer Service

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