

### Features

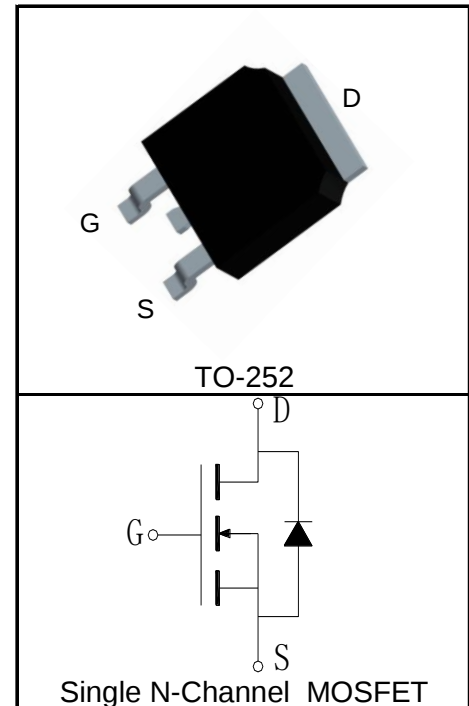
- 100V/60A,  
 $R_{DS(ON)} = 7m\Omega(Typ.)@V_{GS}=10V$   
 $R_{DS(ON)} = 9m\Omega(Typ.)@V_{GS}=4.5V$
- Excellent  $Q_G \times R_{DS(on)}$  product(FOM)
- SGT Technology
- 100% Avalanche Tested

### Applications

- Power Switching Appliaction
- LED Backlighting



### Pin Description



### Absolute Maximum Ratings

| Symbol                                                       | Parameter                                      |                       | Rating     | Unit |
|--------------------------------------------------------------|------------------------------------------------|-----------------------|------------|------|
| Common Ratings (T <sub>C</sub> =25°C Unless Otherwise Noted) |                                                |                       |            |      |
| V <sub>DSS</sub>                                             | Drain-Source Voltage                           |                       | 100        | V    |
| V <sub>GSS</sub>                                             | Gate-Source Voltage                            |                       | ±20        |      |
| T <sub>J</sub>                                               | Maximum Junction Temperature                   |                       | 175        | °C   |
| T <sub>STG</sub>                                             | Storage Temperature Range                      |                       | -55 to 175 | °C   |
| I <sub>S</sub>                                               | Diode Continuous Forward Current               | T <sub>C</sub> =25°C  | 60         | A    |
| Mounted on Large Heat Sink                                   |                                                |                       |            |      |
| I <sub>DP</sub> <sup>①</sup>                                 | 300μs Pulse Drain Current Tested               | T <sub>C</sub> =25°C  | 240        | A    |
| I <sub>D</sub> <sup>②</sup>                                  | Continuous Drain Current(V <sub>GS</sub> =10V) | T <sub>C</sub> =25°C  | 60         | A    |
|                                                              |                                                | T <sub>C</sub> =100°C | 42         |      |
| P <sub>D</sub>                                               | Maximum Power Dissipation                      | T <sub>C</sub> =25°C  | 79         | W    |
|                                                              |                                                | T <sub>C</sub> =100°C | 39         |      |
| R <sub>θJC</sub>                                             | Thermal Resistance-Junction to Case            |                       | 1.9        | °C/W |
| R <sub>θJA</sub> <sup>③</sup>                                | Thermal Resistance-Junction to Ambient         |                       | 100        | °C/W |
| Drain-Source Avalanche Ratings                               |                                                |                       |            |      |
| E <sub>AS</sub> <sup>④</sup>                                 | Avalanche Energy, Single Pulsed                |                       | 20         | mJ   |

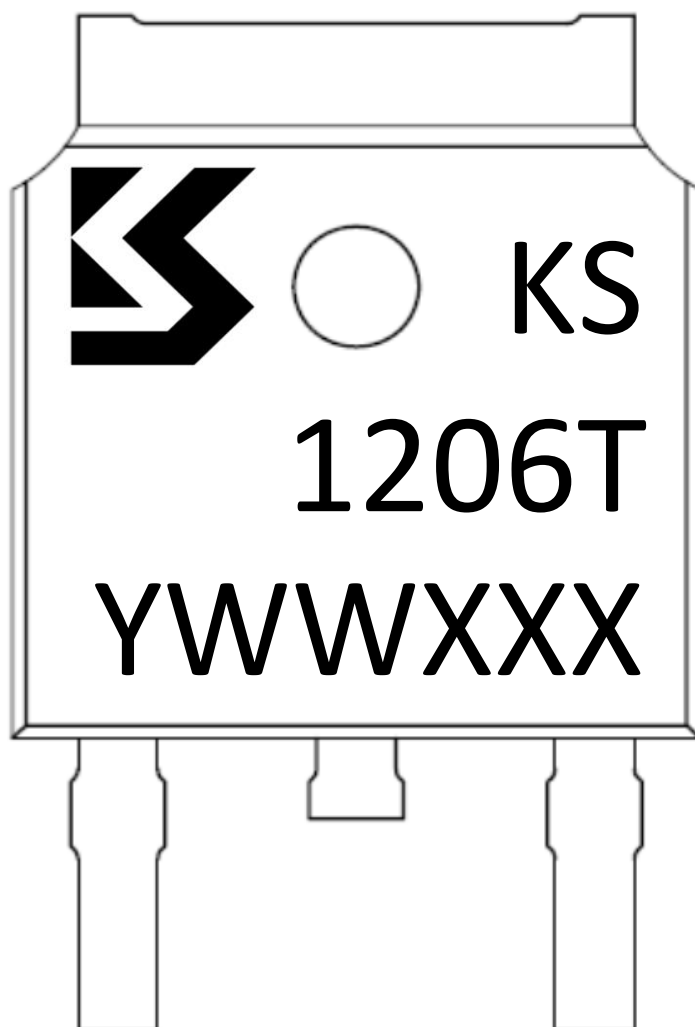
**Electrical Characteristics** ( $T_C=25^{\circ}\text{C}$  Unless Otherwise Noted)

| Symbol                                   | Parameter                        | Test Condition                                                                        | KS1206DAT |      |      | Unit |
|------------------------------------------|----------------------------------|---------------------------------------------------------------------------------------|-----------|------|------|------|
|                                          |                                  |                                                                                       | Min.      | Typ. | Max. |      |
| Static Characteristics                   |                                  |                                                                                       |           |      |      |      |
| BV <sub>DSS</sub>                        | Drain-Source Breakdown Voltage   | V <sub>GS</sub> =0V, I <sub>DS</sub> =250μA                                           | 100       |      |      | V    |
| I <sub>DSS</sub>                         | Zero Gate Voltage Drain Current  | V <sub>DS</sub> =100V, 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                             | 1.2       | 1.8  | 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> =20A                                            |           | 7    | 12   | mΩ   |
|                                          |                                  | V <sub>GS</sub> =4.5V, I <sub>DS</sub> =16A                                           |           | 9    | 16   | mΩ   |
| Diode Characteristics                    |                                  |                                                                                       |           |      |      |      |
| V <sub>SD</sub> <sup>⑤</sup>             | Diode Forward Voltage            | I <sub>SD</sub> =20A, V <sub>GS</sub> =0V                                             |           | 0.85 | 1.2  | V    |
| t <sub>rr</sub>                          | Reverse Recovery Time            | I <sub>SD</sub> =20A, dI <sub>SD</sub> /dt=100A/μs                                    |           | 26   |      | ns   |
| Q <sub>rr</sub>                          | Reverse Recovery Charge          |                                                                                       |           | 41   |      | nC   |
| Dynamic Characteristics <sup>⑥</sup>     |                                  |                                                                                       |           |      |      |      |
| R <sub>G</sub>                           | Gate Resistance                  | V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz                                      |           | 0.9  |      | Ω    |
| C <sub>iss</sub>                         | Input Capacitance                | V <sub>GS</sub> =0V, V <sub>DS</sub> =50V, Frequency=1.0MHz                           |           | 1750 |      | pF   |
| C <sub>oss</sub>                         | Output Capacitance               |                                                                                       |           | 815  |      |      |
| C <sub>rss</sub>                         | Reverse Transfer Capacitance     |                                                                                       |           | 20   |      |      |
| t <sub>d(ON)</sub>                       | Turn-on Delay Time               | V <sub>DD</sub> =50V, I <sub>DS</sub> =20A, V <sub>GEN</sub> =10V, R <sub>G</sub> =3Ω |           | 12   |      | ns   |
| t <sub>r</sub>                           | Turn-on Rise Time                |                                                                                       |           | 18   |      |      |
| t <sub>d(OFF)</sub>                      | Turn-off Delay Time              |                                                                                       |           | 25   |      |      |
| t <sub>f</sub>                           | Turn-off Fall Time               |                                                                                       |           | 10   |      |      |
| Gate Charge Characteristics <sup>⑥</sup> |                                  |                                                                                       |           |      |      |      |
| Q <sub>g</sub>                           | Total Gate Charge                | V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>DS</sub> =20A                      |           | 21   |      | nC   |
| Q <sub>gs</sub>                          | Gate-Source Charge               |                                                                                       |           | 3.8  |      |      |
| Q <sub>gd</sub>                          | Gate-Drain Charge                |                                                                                       |           | 5.3  |      |      |

- 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  $T_{Jmax}$ ,  $I_{AS}=9A$ ,  $L=0.5mH$ ,  $V_{DD}=48V$ ,  $R_G=25\Omega$ , Starting  $T_J=25^{\circ}\text{C}$ .
  - 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 |
|-----------|---------|-----------|----------|-----------|------------|
| KS1206DAT | TO-252  | Tape&Reel | 2500     | 13"       | 16mm       |

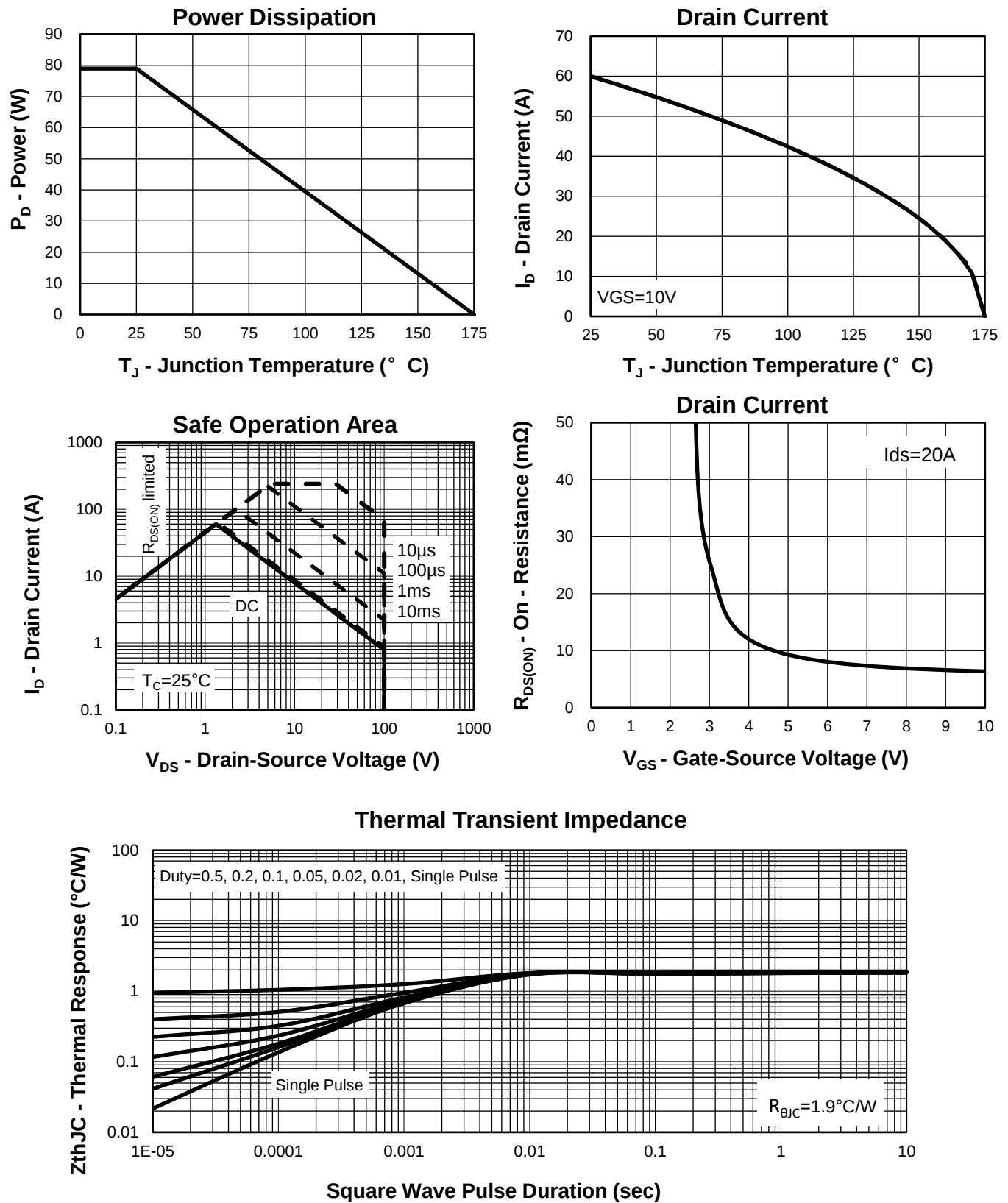


1st Line: Kwansemi LOGO, Kwansemi Code(KS)

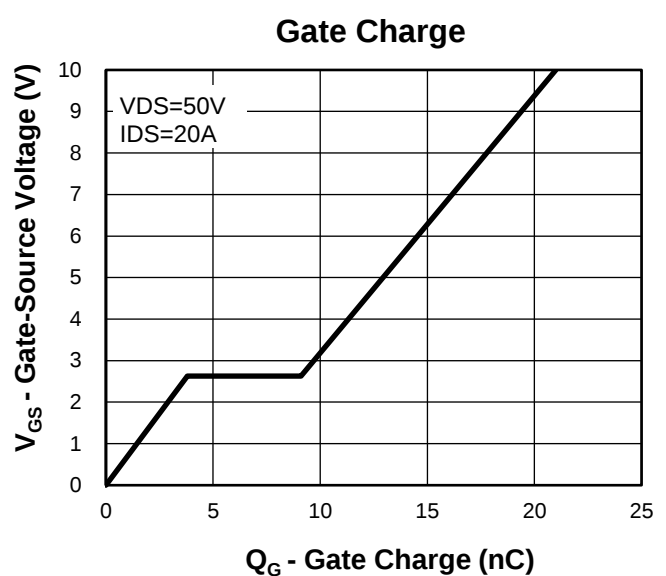
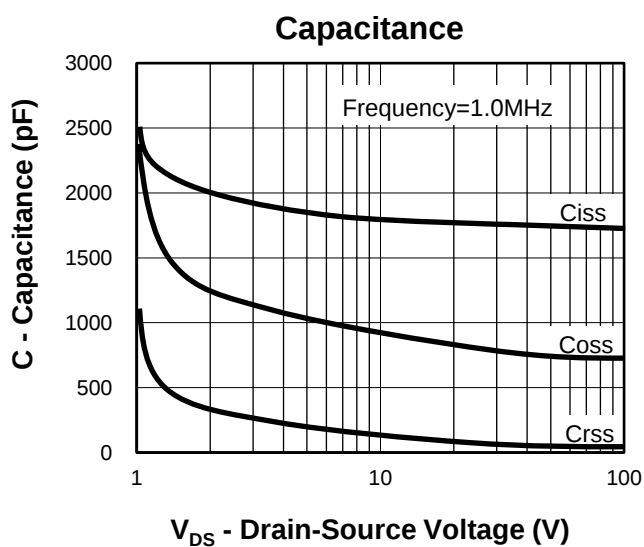
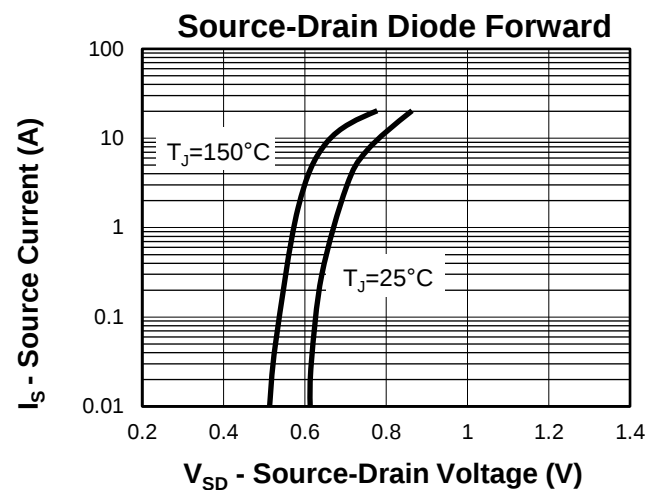
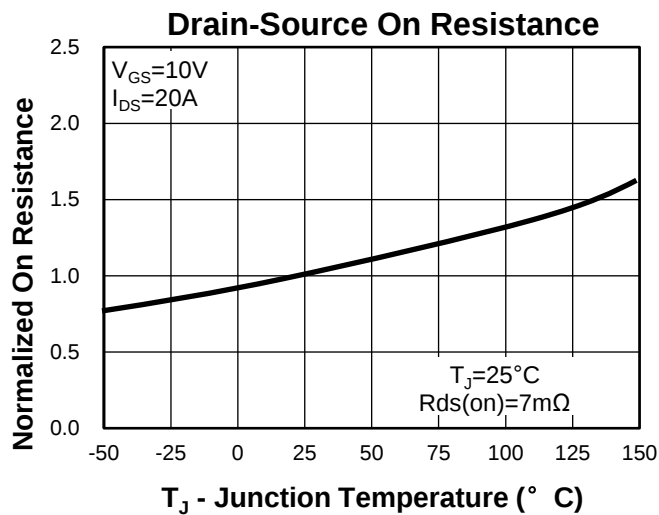
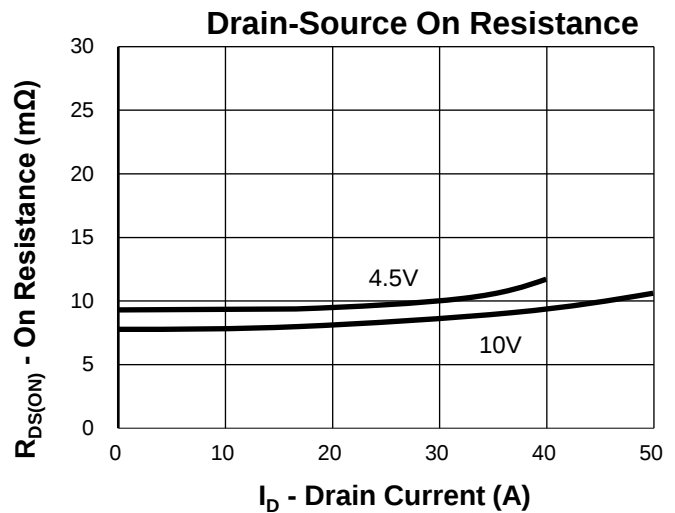
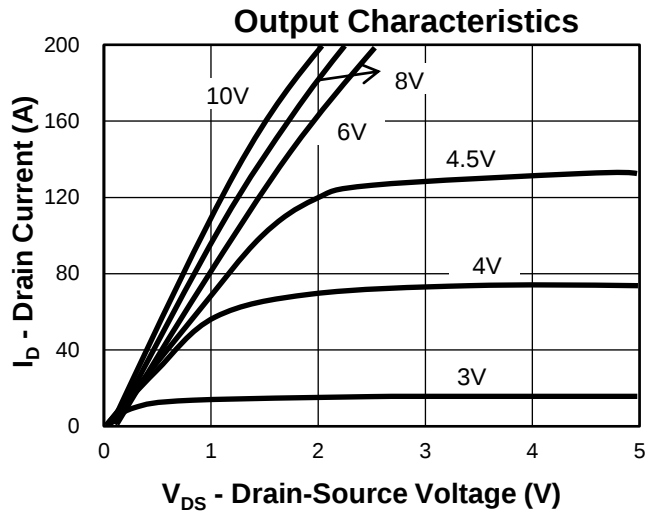
2nd Line: Part Number(1206T)

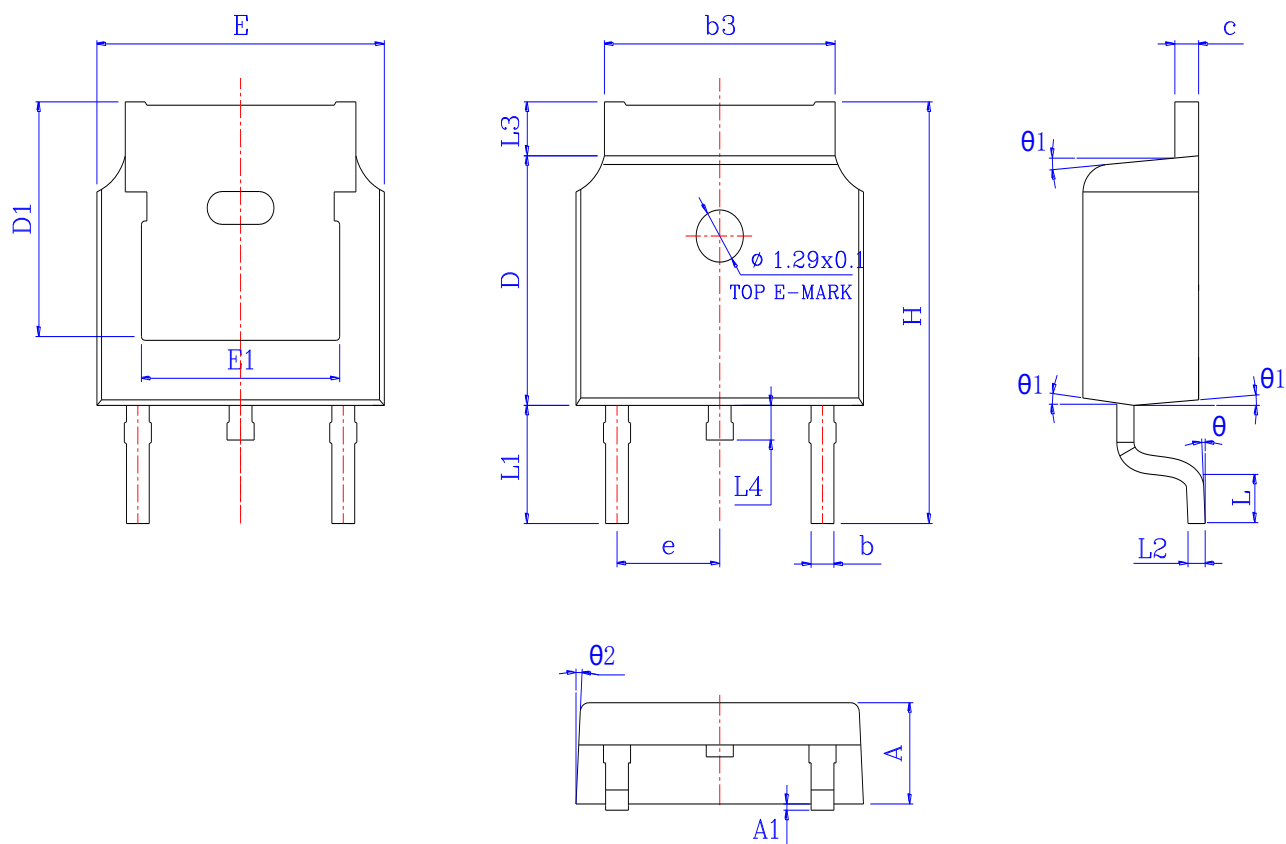
3rd Line: Lot Number(YWWXXX)

## Typical Characteristics



## Typical Characteristics



**Package Information**
**TO-252**


| SYMBOL     | MM        |        |        | INCH      |       |       |
|------------|-----------|--------|--------|-----------|-------|-------|
|            | MIN       | NOM    | MAX    | MIN       | NOM   | MAX   |
| A          | 2.200     | 2.300  | 2.400  | 0.087     | 0.091 | 0.094 |
| A1         | *         | *      | 0.100  | *         | *     | 0.004 |
| b          | 0.660     | 0.760  | 0.860  | 0.026     | 0.030 | 0.034 |
| b3         | 5.130     | 5.295  | 5.460  | 0.202     | 0.208 | 0.215 |
| c          | 0.470     | 0.535  | 0.600  | 0.019     | 0.021 | 0.024 |
| D          | 6.000     | 6.100  | 6.200  | 0.236     | 0.240 | 0.244 |
| D1         | 5.30 REF  |        |        | 0.20 REF  |       |       |
| E          | 6.500     | 6.600  | 6.700  | 0.256     | 0.260 | 0.264 |
| E1         | 4.700     | 4.810  | 4.920  | 0.185     | 0.189 | 0.194 |
| e          | 2.28 REF  |        |        | 0.09 REF  |       |       |
| H          | 9.800     | 10.100 | 10.400 | 0.386     | 0.398 | 0.409 |
| L          | 1.400     | 1.550  | 1.700  | 0.055     | 0.061 | 0.067 |
| L1         | 2.743 REF |        |        | 0.108 REF |       |       |
| L2         | 0.510 BSC |        |        | 0.020 BSC |       |       |
| L3         | 0.900     | 1.075  | 1.250  | 0.035     | 0.042 | 0.049 |
| L4         | 0.600     | 0.800  | 1.000  | 0.024     | 0.031 | 0.039 |
| $\theta$   | 0°        | *      | 8°     | 0°        | *     | 8°    |
| $\theta 1$ | 5°        | 7°     | 9°     | 5°        | 7°    | 9°    |
| $\theta 2$ | 5°        | 7°     | 9°     | 5°        | 7°    | 9°    |

### 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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