

## Features

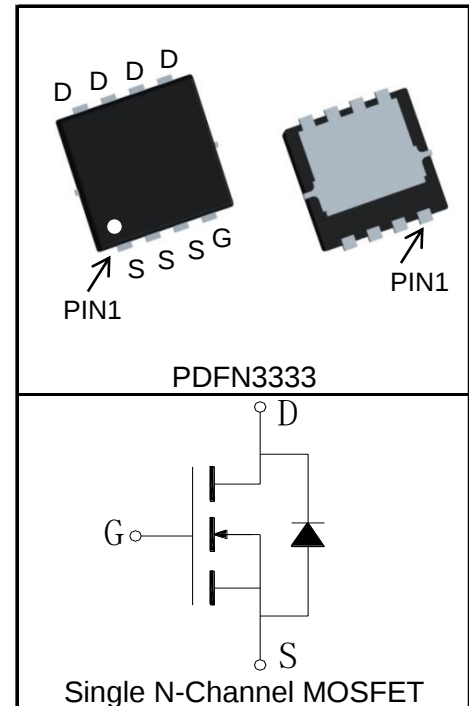
- 30V/90A,  
 $R_{DS(ON)} = 2.1m\Omega(Typ.)@V_{GS}=10V$   
 $R_{DS(ON)} = 3m\Omega(Typ.)@V_{GS}=4.5V$
- Excellent  $Q_G \times R_{DS(on)}$  product(FOM)
- SGT Technology
- Fast Switching Speed
- 100% avalanche tested

## Applications

- Switching Application Systems



## 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                                                        |                       | 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>C</sub> =25°C  | 90         | A    |
| Mounted on Large Heat Sink                                   |                                                                             |                       |            |      |
| I <sub>DP</sub> <sup>①</sup>                                 | 300μs Pulse Drain Current Tested                                            | T <sub>C</sub> =25°C  | 340        | A    |
| I <sub>D</sub> <sup>②</sup>                                  | Continuous Drain Current@T <sub>C</sub> (V <sub>GS</sub> =10V)              | T <sub>C</sub> =25°C  | 90         | A    |
|                                                              |                                                                             | T <sub>C</sub> =100°C | 57         |      |
|                                                              | Continuous Drain Current@T <sub>A</sub> (V <sub>GS</sub> =10V) <sup>③</sup> | T <sub>A</sub> =25°C  | 27         |      |
|                                                              |                                                                             | T <sub>A</sub> =70°C  | 22         |      |
| P <sub>D</sub>                                               | Maximum Power Dissipation@T <sub>C</sub>                                    | T <sub>C</sub> =25°C  | 38         | W    |
|                                                              |                                                                             | T <sub>C</sub> =100°C | 15         |      |
|                                                              | Maximum Power Dissipation@T <sub>A</sub> <sup>③</sup>                       | T <sub>A</sub> =25°C  | 3.5        |      |
|                                                              |                                                                             | T <sub>A</sub> =70°C  | 2.3        |      |

| Symbol                                | Parameter                              | Rating | Unit |
|---------------------------------------|----------------------------------------|--------|------|
| $R_{\theta JC}$                       | Thermal Resistance-Junction to Case    | 3.3    | °C/W |
| $R_{\theta JA}^{③}$                   | Thermal Resistance-Junction to Ambient | 35     | °C/W |
| <b>Drain-Source Avalanche Ratings</b> |                                        |        |      |
| $E_{AS}^{④}$                          | Avalanche Energy, Single Pulsed        | 72     | mJ   |

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

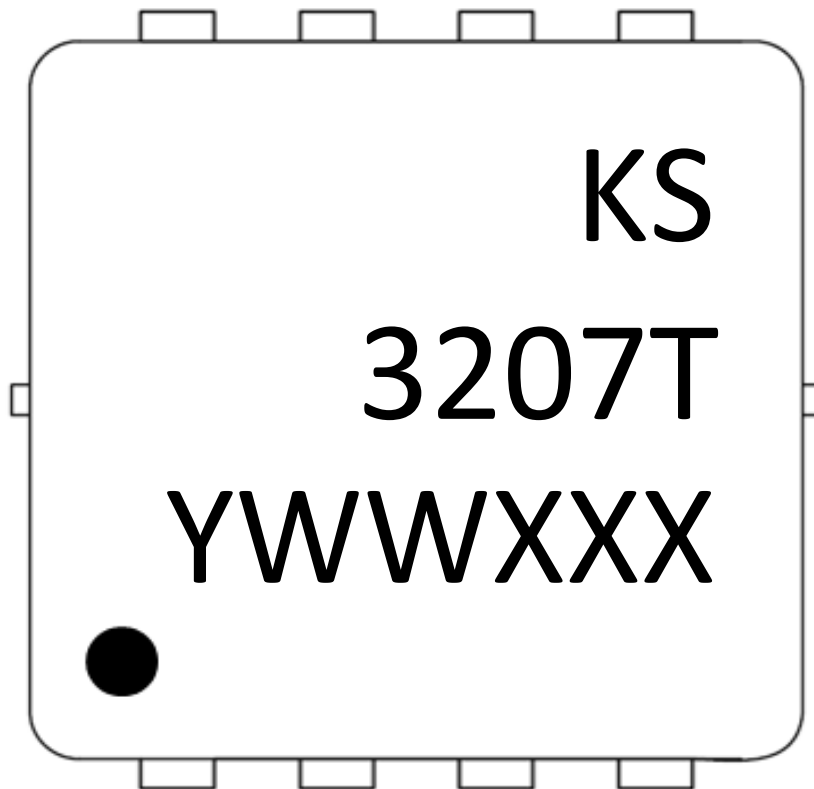
| Symbol                        | Parameter                        | Test Condition                                                                       | KS3207MAT |      |      | Unit |
|-------------------------------|----------------------------------|--------------------------------------------------------------------------------------|-----------|------|------|------|
|                               |                                  |                                                                                      | 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                            | 1.1       | 1.7  | 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> ⑤         | Drain-Source On-state Resistance | V <sub>GS</sub> =10V, I <sub>DS</sub> =20A                                           |           | 2.1  | 2.6  | mΩ   |
|                               |                                  | V <sub>GS</sub> =4.5V, I <sub>DS</sub> =15A                                          |           | 3    | 4    | mΩ   |
| Diode Characteristics         |                                  |                                                                                      |           |      |      |      |
| V <sub>SD</sub> ⑤             | Diode Forward Voltage            | I <sub>SD</sub> =20A, V <sub>GS</sub> =0V                                            |           | 0.82 | 1.2  | V    |
| t <sub>rr</sub>               | Reverse Recovery Time            | I <sub>SD</sub> =20A, dI <sub>SD</sub> /dt=100A/μs                                   |           | 25   |      | ns   |
| Q <sub>rr</sub>               | Reverse Recovery Charge          |                                                                                      |           | 44   |      | nC   |
| Dynamic Characteristics ⑥     |                                  |                                                                                      |           |      |      |      |
| R <sub>G</sub>                | Gate Resistance                  | V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz                                     |           | 1.2  |      | Ω    |
| C <sub>iss</sub>              | Input Capacitance                | V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, Frequency=1.0MHz                          |           | 1500 |      | pF   |
| C <sub>oss</sub>              | Output Capacitance               |                                                                                      |           | 455  |      |      |
| C <sub>rss</sub>              | Reverse Transfer Capacitance     |                                                                                      |           | 30   |      |      |
| t <sub>d(ON)</sub>            | Turn-on Delay Time               | V <sub>DD</sub> =15V, I <sub>DS</sub> =20A, V <sub>GS</sub> =10V, R <sub>G</sub> =3Ω |           | 12   |      | ns   |
| t <sub>r</sub>                | Turn-on Rise Time                |                                                                                      |           | 15   |      |      |
| t <sub>d(OFF)</sub>           | Turn-off Delay Time              |                                                                                      |           | 43   |      |      |
| t <sub>f</sub>                | Turn-off Fall Time               |                                                                                      |           | 26   |      |      |
| Gate Charge Characteristics ⑥ |                                  |                                                                                      |           |      |      |      |
| Q <sub>g</sub>                | Total Gate Charge                | V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, I <sub>DS</sub> =20A                     |           | 30   |      | nC   |
| Q <sub>gs</sub>               | Gate-Source Charge               |                                                                                      |           | 6    |      |      |
| Q <sub>gd</sub>               | Gate-Drain Charge                |                                                                                      |           | 5.5  |      |      |

**Notes:**

- ①Pulse width limited by safe operating area.
- ②Calculated continuous current based on maximum allowable junction temperature.
- ③When mounted on 1 inch square copper board,  $t \leq 10\text{sec}$ .
- ④Limited by  $T_{J\max}$ ,  $I_{AS} = 17\text{A}$ ,  $L = 0.5\text{mH}$ ,  $V_{DD} = 15\text{V}$ ,  $R_G = 25\Omega$ , Starting  $T_J = 25^\circ\text{C}$ .
- ⑤Pulse test; Pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .
- ⑥Guaranteed by design, not subject to production testing.

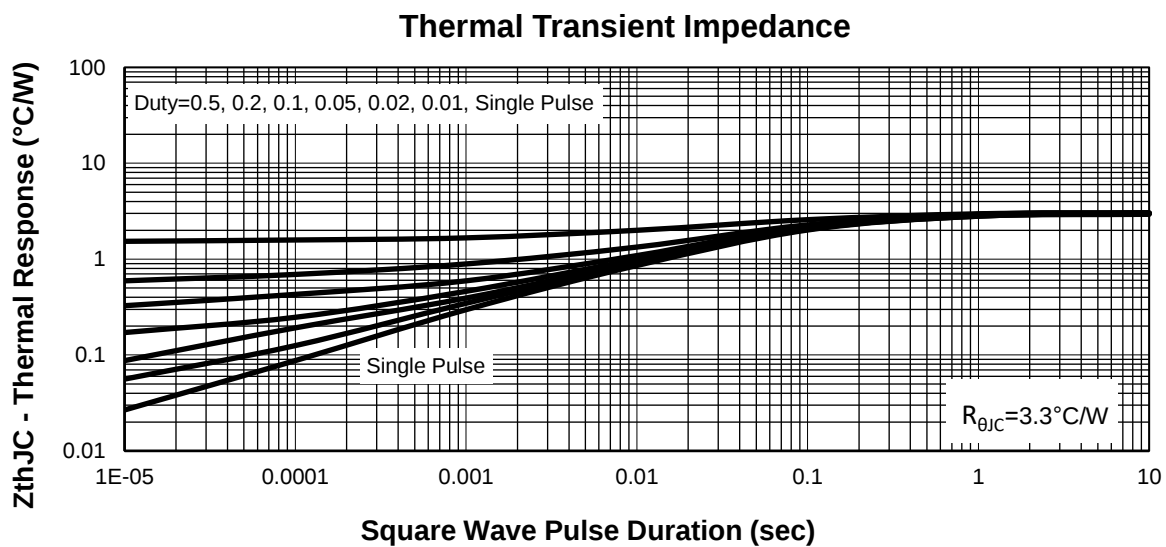
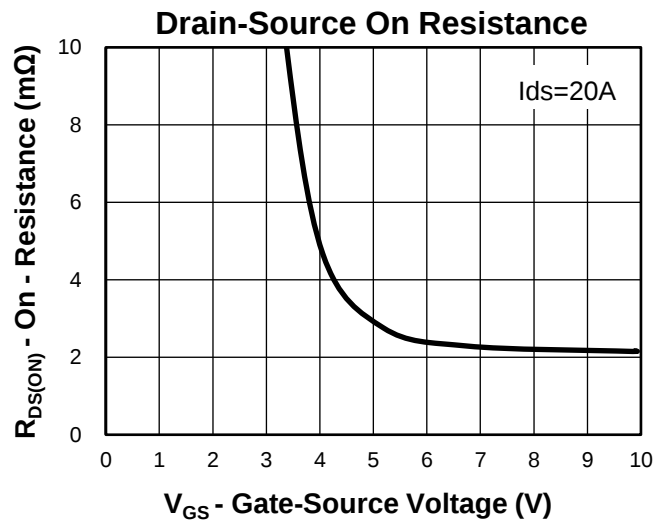
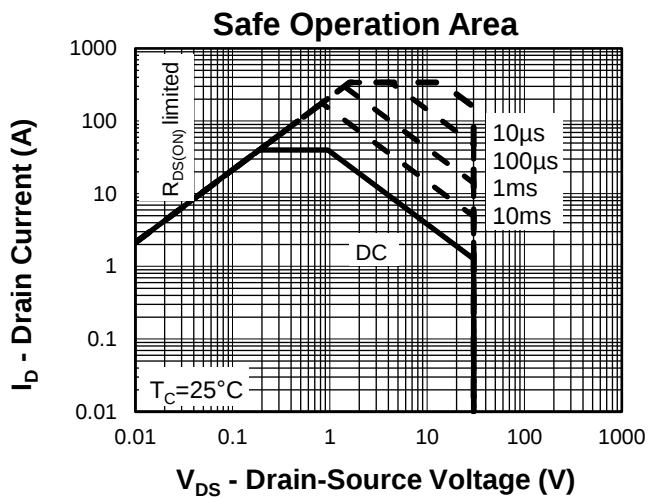
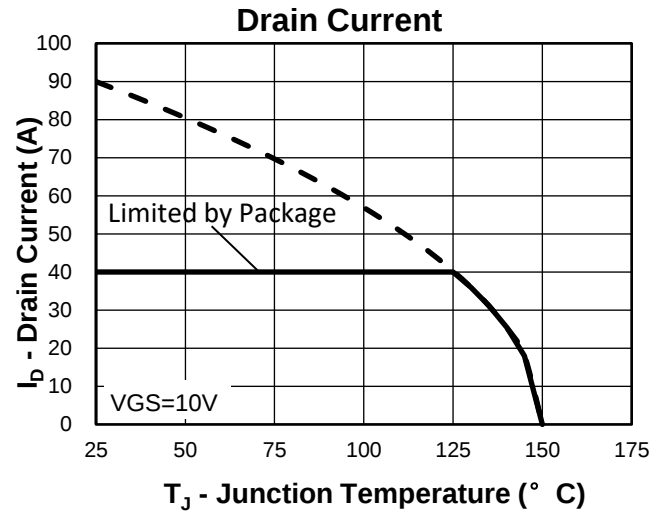
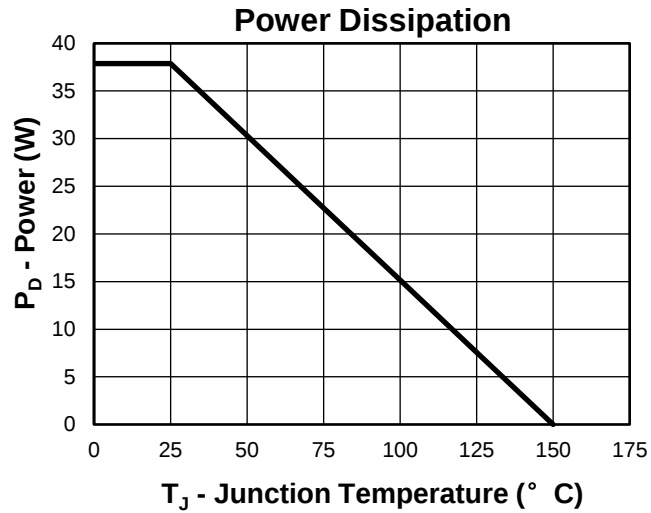
**Ordering and Marking Information**

| Device    | Package  | Packaging | Quantity | Reel Size | Tape width |
|-----------|----------|-----------|----------|-----------|------------|
| KS3207MAT | PDFN3333 | Tape&Reel | 5000     | 13"       | 12mm       |

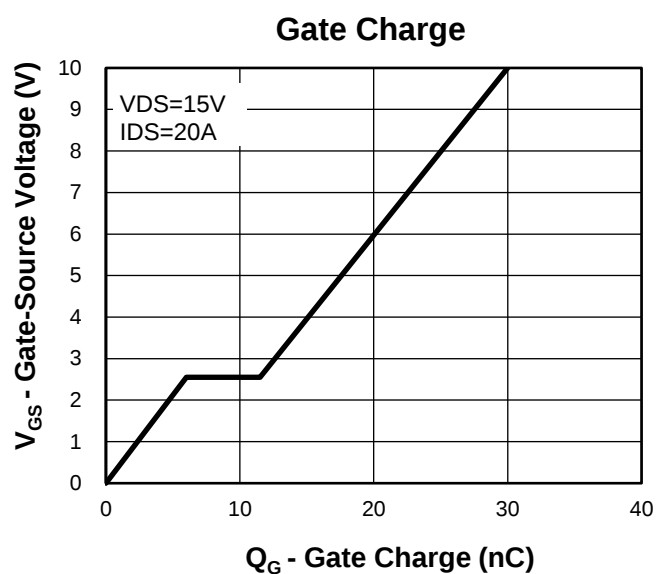
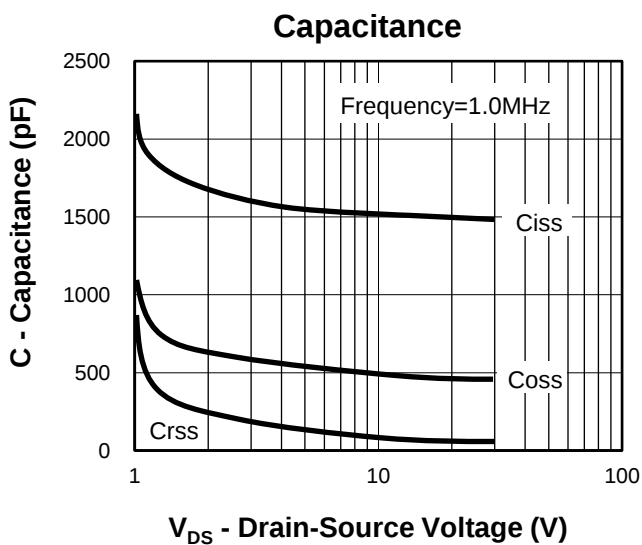
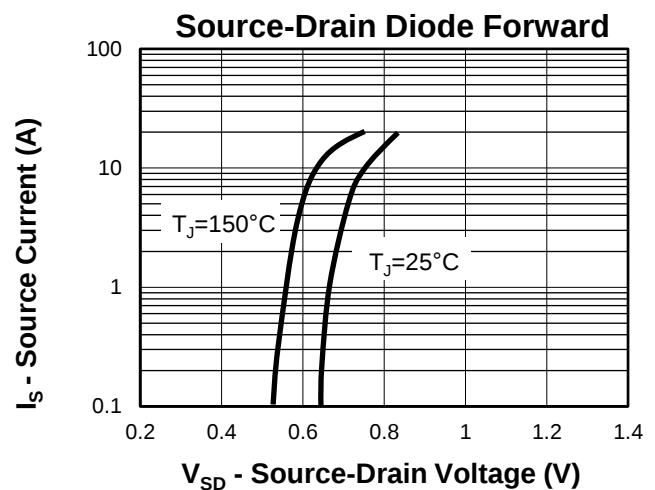
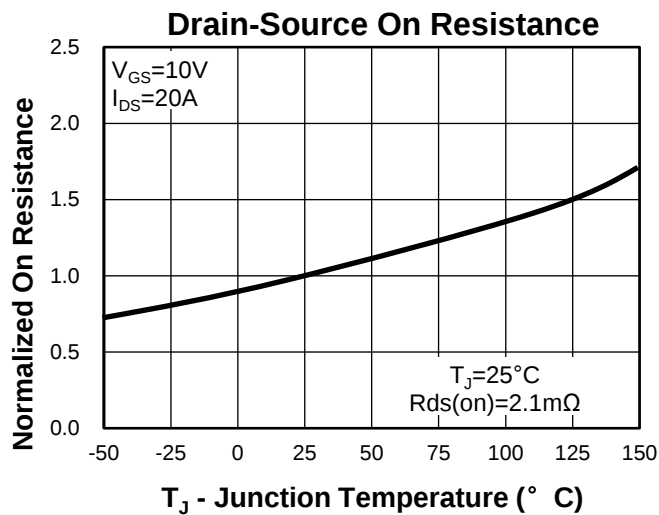
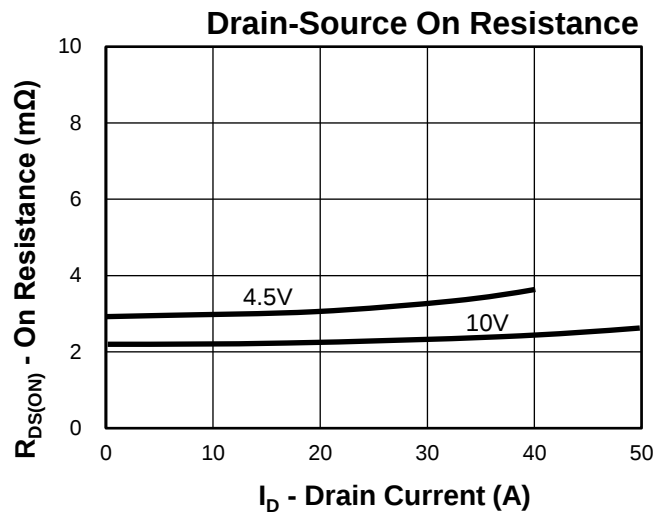
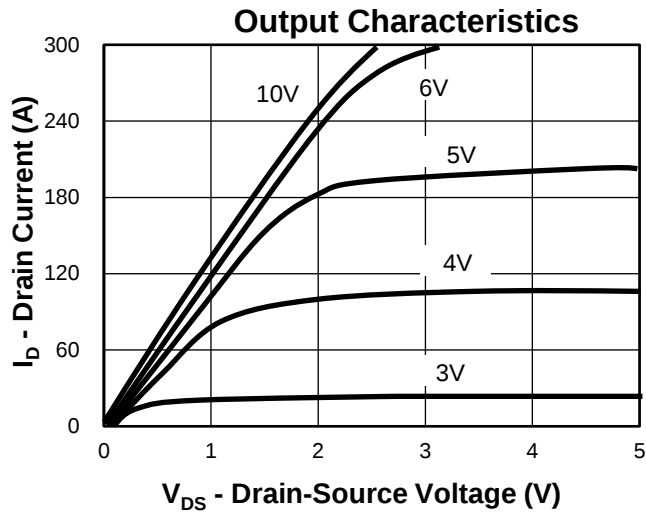


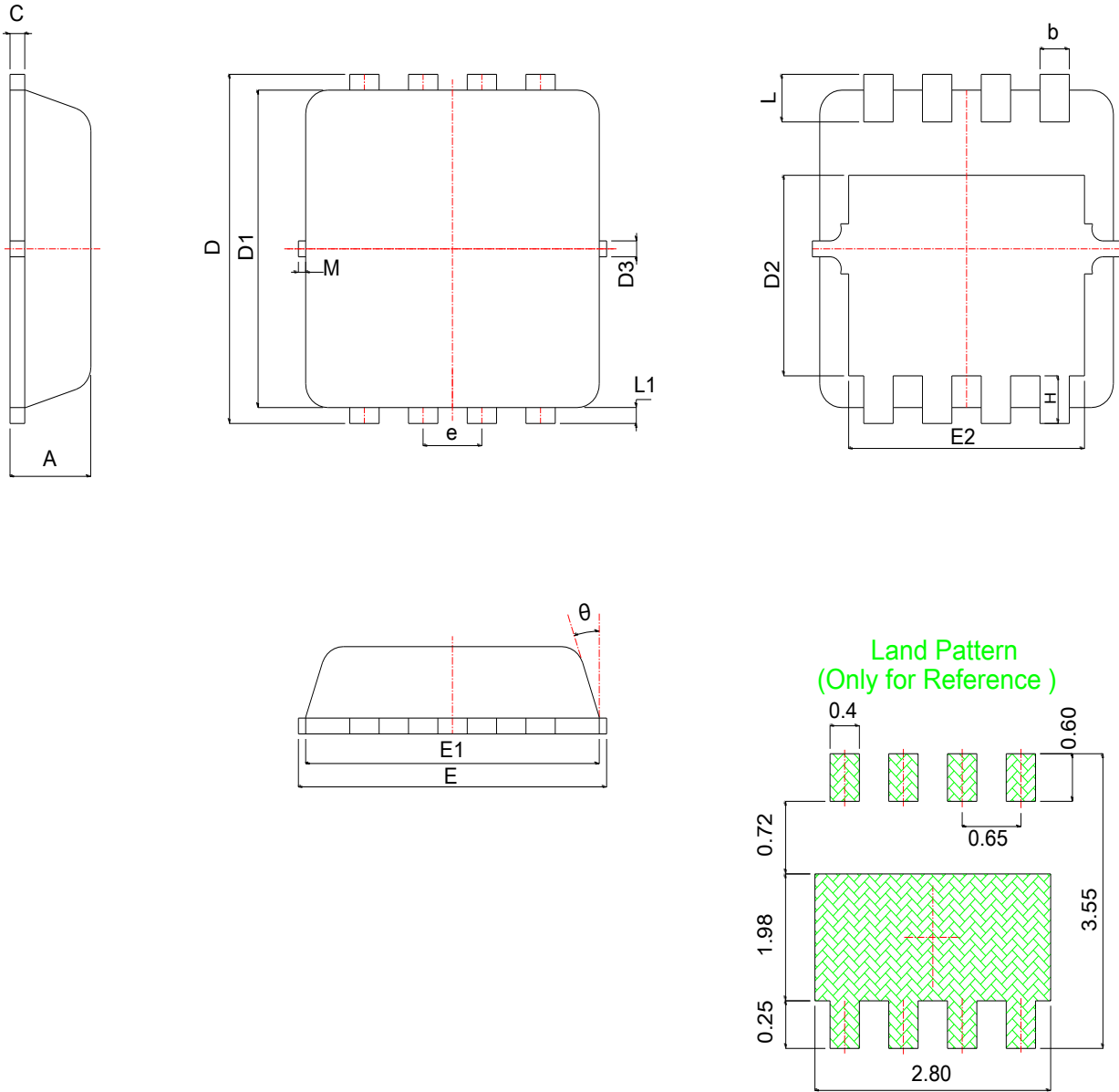
1st Line: Kwansemi Code(KS)  
 2nd Line: Part Number(3207T)  
 3rd Line: Lot Number(YWWXXX)

## Typical Characteristics



## Typical Characteristics



**Package Information**
**PDFN3333**


| SYMBOL | MM   |      |      | INCH  |       |       | SYMBOL | MM      |      |      | INCH     |       |       |
|--------|------|------|------|-------|-------|-------|--------|---------|------|------|----------|-------|-------|
|        | MIN  | NOM  | MAX  | MIN   | NOM   | MAX   |        | MIN     | NOM  | MAX  | MIN      | NOM   | MAX   |
| A      | 0.67 | 0.78 | 0.88 | 0.026 | 0.031 | 0.035 | E1     | 3.05    | 3.15 | 3.25 | 0.120    | 0.124 | 0.128 |
| b      | 0.25 | 0.30 | 0.35 | 0.010 | 0.012 | 0.014 | E2     | 2.25    | 2.45 | 2.65 | 0.089    | 0.096 | 0.104 |
| c      | 0.10 | 0.15 | 0.25 | 0.004 | 0.006 | 0.010 | e      | 0.65BSC |      |      | 0.026BSC |       |       |
| D      | 3.15 | 3.35 | 3.55 | 0.124 | 0.132 | 0.140 | H      | 0.30    | 0.40 | 0.50 | 0.012    | 0.016 | 0.020 |
| D1     | 3.00 | 3.10 | 3.20 | 0.118 | 0.122 | 0.126 | L      | 0.30    | 0.40 | 0.50 | 0.012    | 0.016 | 0.020 |
| D2     | 1.53 | 1.73 | 1.93 | 0.060 | 0.068 | 0.076 | L1     | *       | 0.13 | *    | *        | 0.005 | *     |
| D3     | *    | 0.13 | *    | *     | 0.005 | *     | theta  | *       | 10°  | 12°  | *        | 10°   | 12°   |
| E      | 3.10 | 3.30 | 3.50 | 0.122 | 0.130 | 0.138 | M      | *       | *    | 0.15 | *        | *     | 0.006 |

### 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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