

- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

### Product Summary



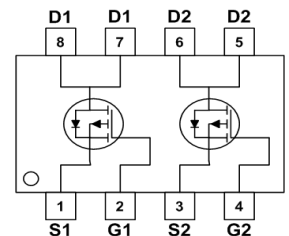
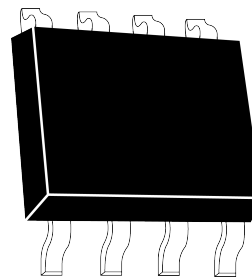
| BVDSS | RDSON | ID  |
|-------|-------|-----|
| -40V  | 34 mΩ | -6A |

### General Description

The JH4907 is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The JH4907 meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

### SOP8 Pin Configuration



### Absolute Maximum Ratings (T<sub>A</sub>= 25°C, unless otherwise noted)

| Parameter                                        |                       | Symbol                            | Value      | Unit |
|--------------------------------------------------|-----------------------|-----------------------------------|------------|------|
| Drain-Source Voltage                             |                       | V <sub>DS</sub>                   | -40        | V    |
| Gate-Source Voltage                              |                       | V <sub>GS</sub>                   | ±20        | V    |
| Continuous Drain Current                         | T <sub>A</sub> =25°C  | I <sub>D</sub>                    | -6         | A    |
|                                                  | T <sub>A</sub> =100°C |                                   | -3.8       |      |
| Pulsed Drain Current <sup>1</sup>                |                       | I <sub>DM</sub>                   | -24        | A    |
| Single Pulse Avalanche Energy <sup>2</sup>       |                       | EAS                               | 18         | mJ   |
| Total Power Dissipation                          | T <sub>A</sub> =25°C  | P <sub>D</sub>                    | 3          | W    |
| Operating Junction and Storage Temperature Range |                       | T <sub>J</sub> , T <sub>STG</sub> | -55 to 150 | °C   |

### Thermal Characteristics

| Parameter                                                | Symbol           | Value | Unit |
|----------------------------------------------------------|------------------|-------|------|
| Thermal Resistance from Junction-to-Ambient <sup>3</sup> | R <sub>θJA</sub> | 41.7  | °C/W |

### Electrical Characteristics (T<sub>J</sub> = 25°C, unless otherwise noted)

| Parameter                               |                       | Symbol               | Test Conditions                                                                           | Min. | Typ. | Max. | Unit |
|-----------------------------------------|-----------------------|----------------------|-------------------------------------------------------------------------------------------|------|------|------|------|
| Static Characteristics                  |                       |                      |                                                                                           |      |      |      |      |
| Drain-Source Breakdown Voltage          |                       | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA                                             | -40  | -    | -    | V    |
| Gate-body Leakage current               |                       | I <sub>GSS</sub>     | V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V                                              | -    | -    | ±100 | nA   |
| Zero Gate Voltage Drain Current         | T <sub>J</sub> =25°C  | I <sub>DSS</sub>     | V <sub>DS</sub> = -40V, V <sub>GS</sub> = 0V                                              | -    | -    | -1   | μA   |
|                                         | T <sub>J</sub> =100°C |                      |                                                                                           | -    | -    | -100 |      |
| Gate-Threshold Voltage                  |                       | V <sub>GS(th)</sub>  | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA                               | -1.0 | -1.5 | -2.5 | V    |
| Drain-Source On-Resistance <sup>4</sup> |                       | R <sub>DS(on)</sub>  | V <sub>GS</sub> = -10V, I <sub>D</sub> = -5A                                              | -    | 34   | 45   | mΩ   |
|                                         |                       |                      | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -3A                                             | -    | 44   | 58   |      |
| Forward Transconductance <sup>4</sup>   |                       | g <sub>fs</sub>      | V <sub>DS</sub> = -10V, I <sub>D</sub> = -6A                                              | -    | 16   | -    | S    |
| Dynamic Characteristics <sup>5</sup>    |                       |                      |                                                                                           |      |      |      |      |
| Input Capacitance                       |                       | C <sub>iss</sub>     | V <sub>DS</sub> = -20V, V <sub>GS</sub> =0V, f =1MHz                                      | -    | 1080 | -    | pF   |
| Output Capacitance                      |                       | C <sub>oss</sub>     |                                                                                           | -    | 87   | -    |      |
| Reverse Transfer Capacitance            |                       | C <sub>rss</sub>     |                                                                                           | -    | 77   | -    |      |
| Gate Resistance                         |                       | R <sub>g</sub>       | f =1MHz                                                                                   | -    | 10.3 | -    | Ω    |
| Switching Characteristics <sup>5</sup>  |                       |                      |                                                                                           |      |      |      |      |
| Total Gate Charge                       |                       | Q <sub>g</sub>       | V <sub>GS</sub> = -10V,V <sub>DS</sub> = -20V, I <sub>D</sub> = -5A                       | -    | 17   | -    | nC   |
| Gate-Source Charge                      |                       | Q <sub>gs</sub>      |                                                                                           | -    | 4.2  | -    |      |
| Gate-Drain Charge                       |                       | Q <sub>gd</sub>      |                                                                                           | -    | 3.7  | -    |      |
| Turn-On Delay Time                      |                       | t <sub>d(on)</sub>   | V <sub>GS</sub> = -10V, V <sub>DD</sub> = -20V, R <sub>G</sub> = 3Ω, I <sub>D</sub> = -5A | -    | 5.9  | -    | ns   |
| Rise Time                               |                       | t <sub>r</sub>       |                                                                                           | -    | 7.1  | -    |      |
| Turn-Off Delay Time                     |                       | t <sub>d(off)</sub>  |                                                                                           | -    | 25   | -    |      |
| Fall Time                               |                       | t <sub>f</sub>       |                                                                                           | -    | 8.2  | -    |      |
| Drain-Source Body Diode Characteristics |                       |                      |                                                                                           |      |      |      |      |
| Diode Forward Voltage <sup>4</sup>      |                       | V <sub>SD</sub>      | I <sub>S</sub> = -5A, V <sub>GS</sub> = 0V                                                | -    | -    | -1.2 | V    |
| Continuous Source Current               | T <sub>A</sub> =25°C  | I <sub>S</sub>       | -                                                                                         | -    | -    | -6   | A    |

Note :

1. Repetitive rating, pulse width limited by junction temperature T<sub>J(MAX)</sub>=150°C.
2. The EAS data shows Max. rating . The test condition is V<sub>DD</sub>= -25V, V<sub>GS</sub>= -10V, L= 0.1mH, I<sub>AS</sub>= -34A.
3. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test.

### Typical Characteristics

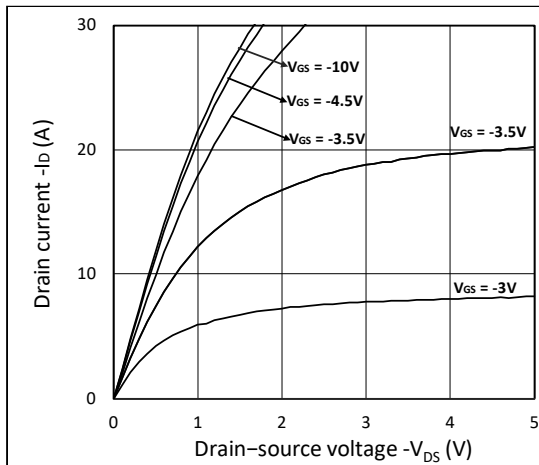


Figure 1. Output Characteristics

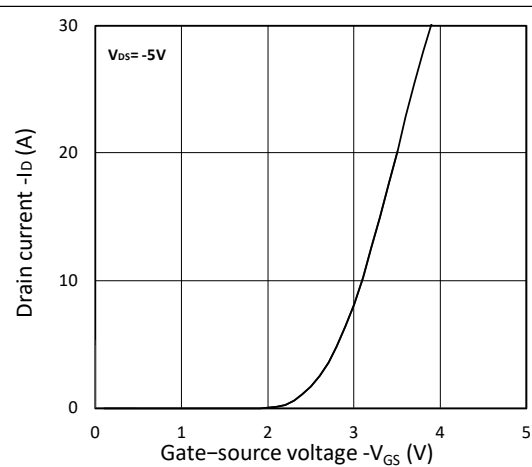


Figure 2. Transfer Characteristics

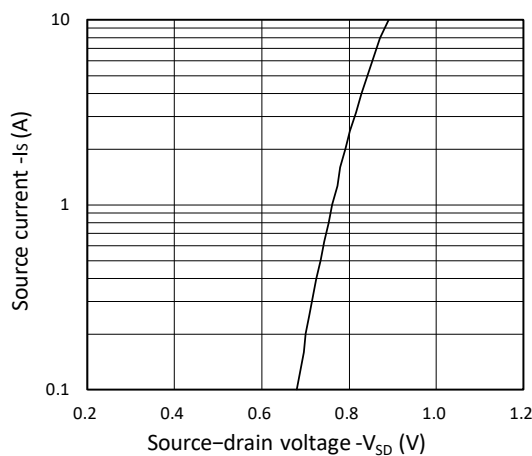


Figure 3. Forward Characteristics of Reverse

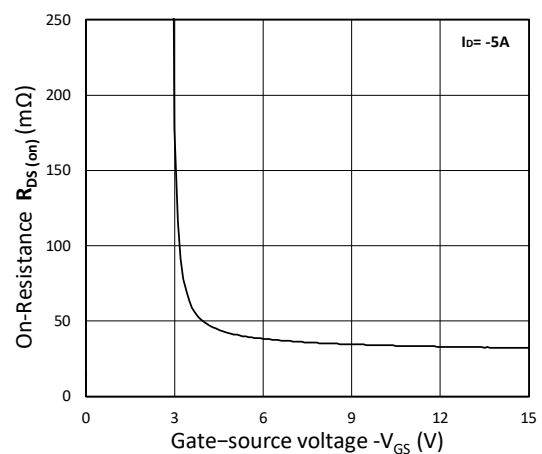


Figure 4.  $R_{DS(ON)}$  vs.  $V_{GS}$

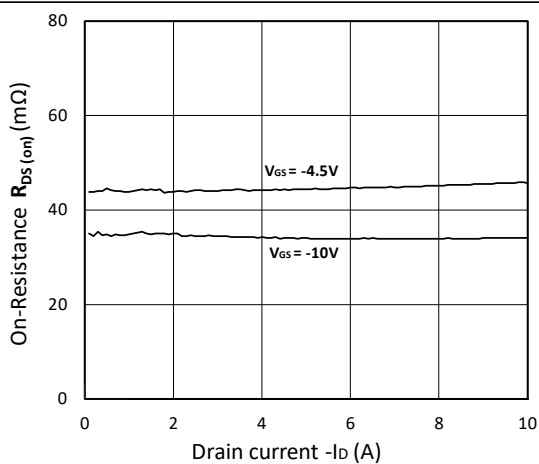


Figure 5.  $R_{DS(ON)}$  vs.  $I_D$

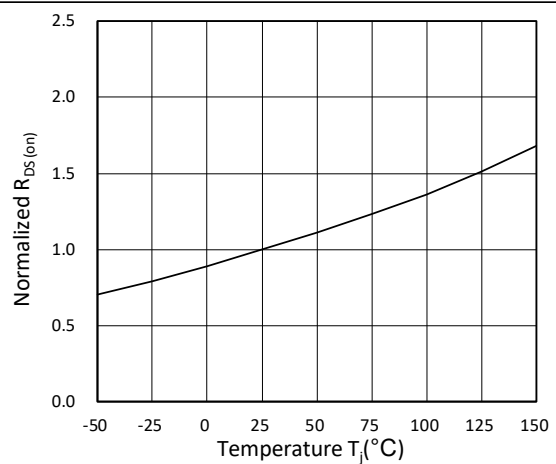


Figure 6. Normalized  $R_{DS(ON)}$  vs. Temperature

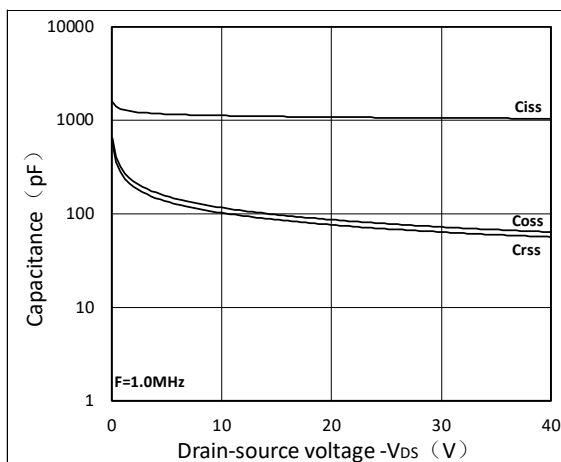


Figure 7. Capacitance Characteristics

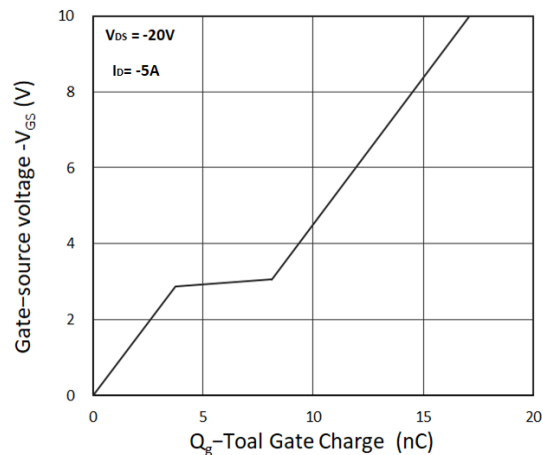


Figure 8. Gate Charge Characteristics

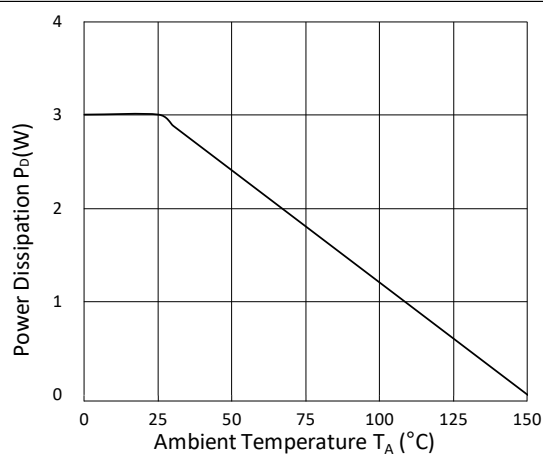


Figure 9. Power Dissipation

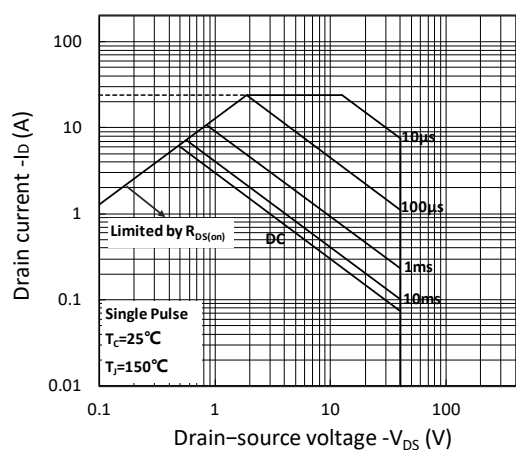


Figure 10. Safe Operating Area

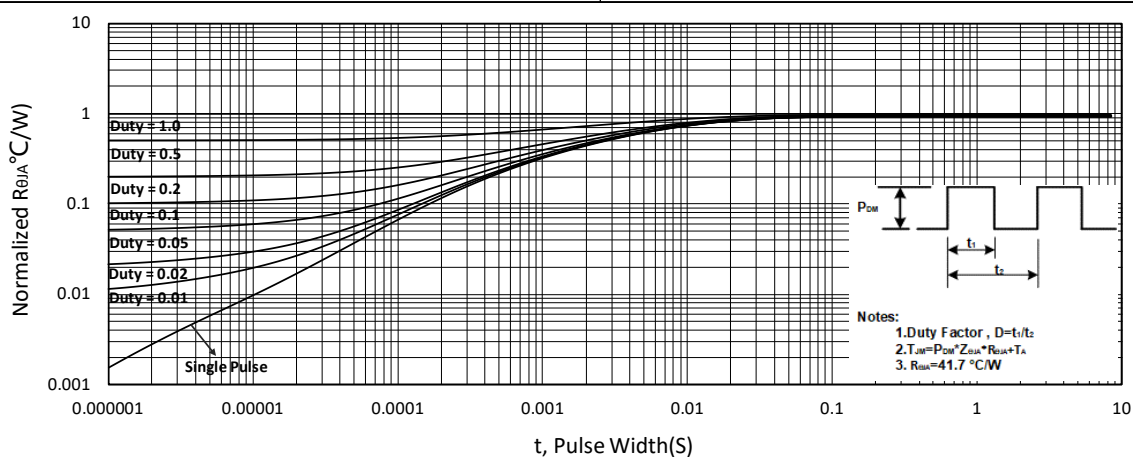


Figure 11. Normalized Maximum Transient Thermal Impedance

## Test Circuit

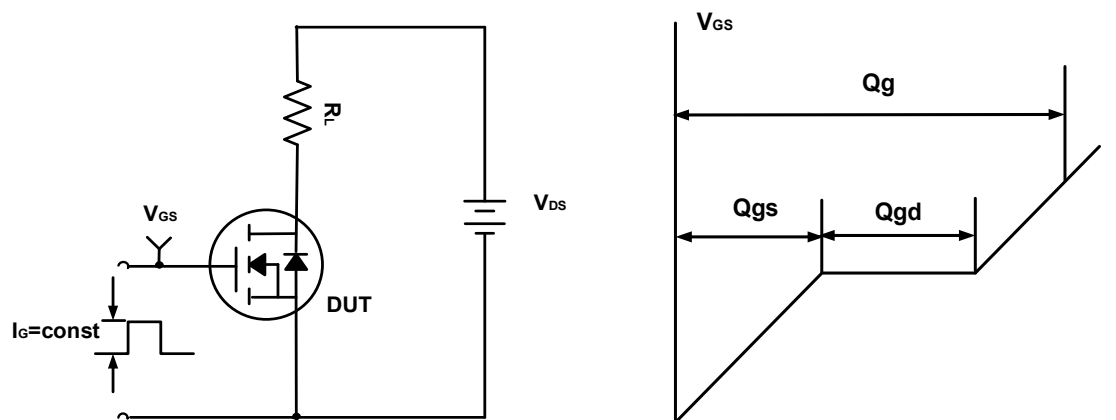


Figure A. Gate Charge Test Circuit & Waveforms

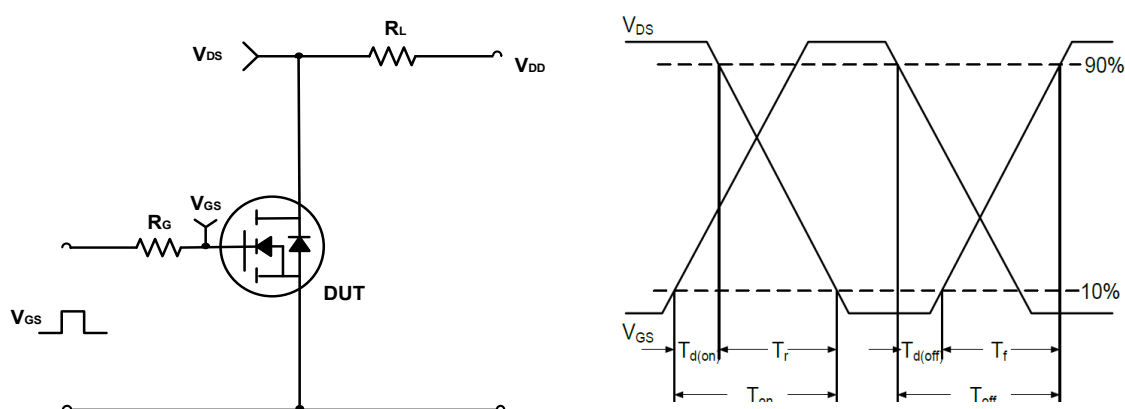


Figure B. Switching Test Circuit & Waveforms

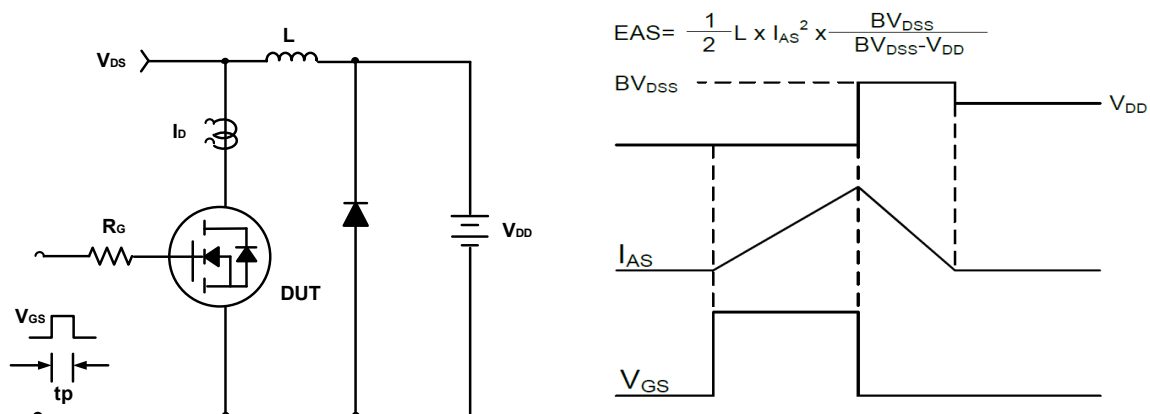
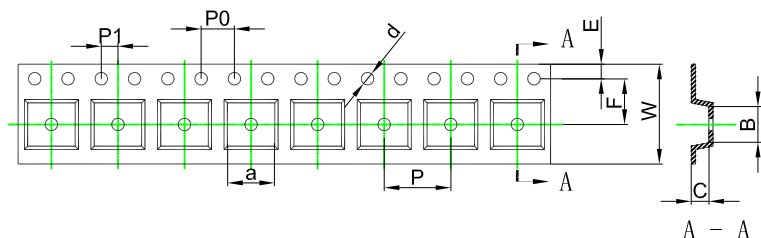


Figure C. Unclamped Inductive Switching Circuit & Waveforms

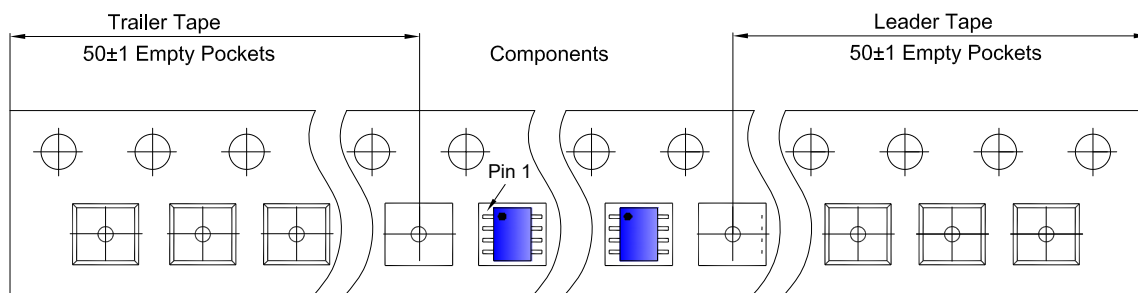
### SOP8 Tape and Reel Information

#### Embossed Carrier Tape

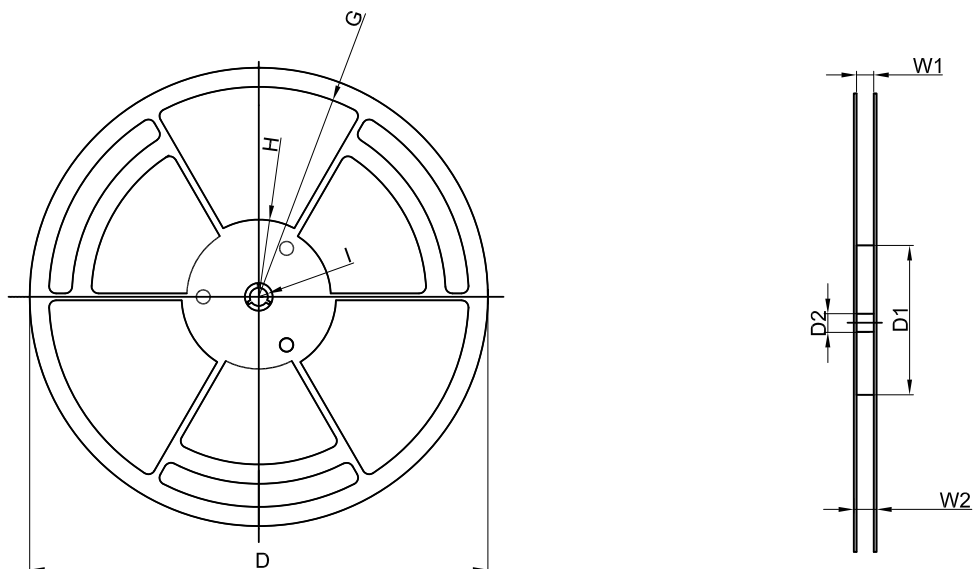


| Dimensions are in millimeter |      |      |      |       |      |      |      |      |      |       |
|------------------------------|------|------|------|-------|------|------|------|------|------|-------|
| Pkg type                     | a    | B    | C    | d     | E    | F    | P0   | P    | P1   | W     |
| SOP8                         | 6.40 | 5.40 | 2.10 | Ø1.50 | 1.75 | 5.50 | 4.00 | 8.00 | 2.00 | 12.00 |

#### Tape Leader and Trailer



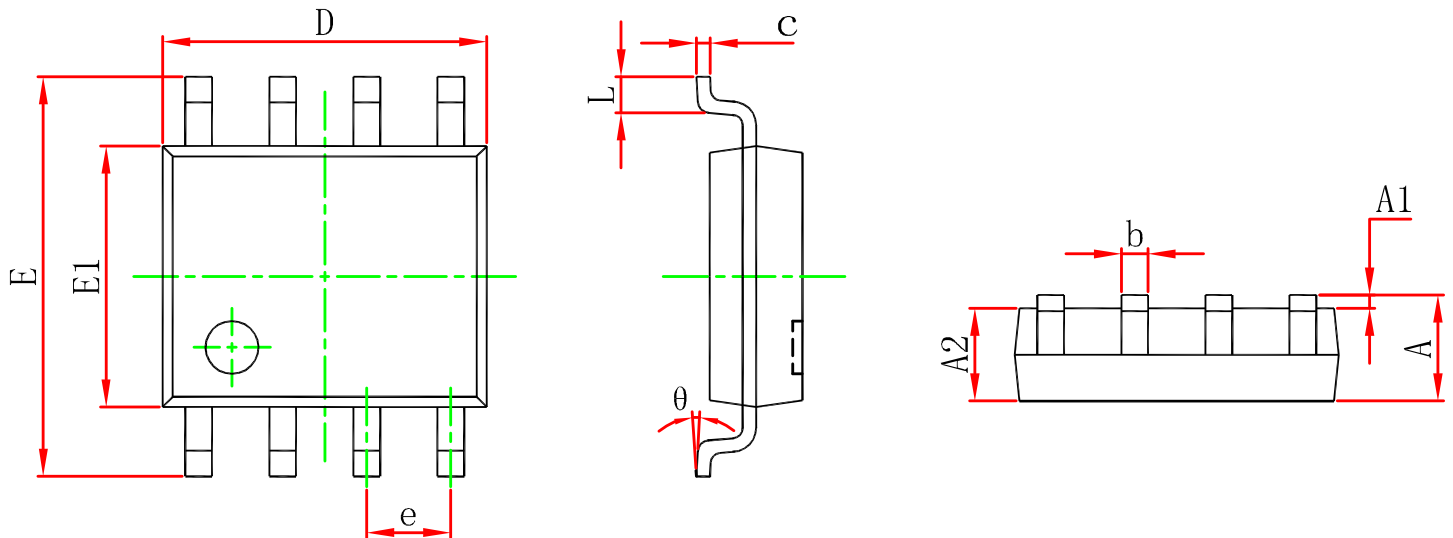
#### Reel



| Dimensions are in millimeter |         |        |       |         |        |       |       |       |
|------------------------------|---------|--------|-------|---------|--------|-------|-------|-------|
| Reel Option                  | D       | D1     | D2    | G       | H      | I     | W1    | W2    |
| 13"Dia                       | Ø330.00 | 100.00 | 13.00 | R151.00 | R56.00 | R6.50 | 12.40 | 17.60 |

| REEL      | Reel Size | Box       | Box Size(mm) | Carton     | Carton Size(mm) | G.W.(kg) |
|-----------|-----------|-----------|--------------|------------|-----------------|----------|
| 3,000 pcs | 13 inch   | 6,000 pcs | 360×360×65   | 48,000 pcs | 565×380×390     |          |



| Symbol   | Dimensions In Millimeters |       | Dimensions In Inches |       |
|----------|---------------------------|-------|----------------------|-------|
|          | Min                       | Max   | Min                  | Max   |
| A        | 1.450                     | 1.750 | 0.053                | 0.069 |
| A1       | 0.100                     | 0.250 | 0.004                | 0.010 |
| A2       | 1.350                     | 1.550 | 0.053                | 0.061 |
| b        | 0.330                     | 0.510 | 0.013                | 0.020 |
| c        | 0.170                     | 0.250 | 0.007                | 0.010 |
| D        | 4.700                     | 5.100 | 0.185                | 0.201 |
| e        | 1.270 (BSC)               |       | 0.050 (BSC)          |       |
| E        | 5.800                     | 6.200 | 0.228                | 0.244 |
| E1       | 3.800                     | 4.000 | 0.150                | 0.157 |
| L        | 0.400                     | 1.270 | 0.016                | 0.050 |
| $\theta$ | 0°                        | 8°    | 0°                   | 8°    |

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