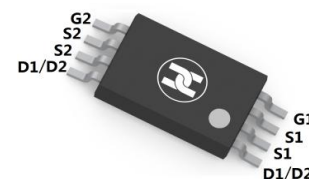
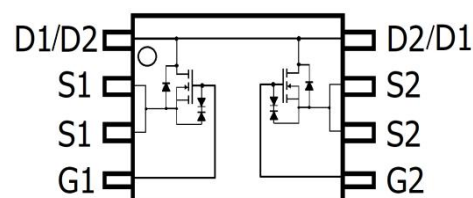


## DUAL N-CHANNEL ENHANCEMENT MODE FET

### FEATURES

- Ultra low on-resistance:  $V_{DS}=20V, I_D=7.5A, R_{DS(ON)} \leq 16m\Omega @ V_{GS}=10V$
- Low gate charge
- ESD protected
- Surface Mount device


**TSSOP-8**


### MECHANICAL DATA

- Case: TSSOP-8
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Weight: not available

### MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Parameter                                   | Symbol          | Value      | Unit               |
|---------------------------------------------|-----------------|------------|--------------------|
| Drain-source voltage                        | $V_{DS}$        | 20         | V                  |
| Gate-source voltage                         | $V_{GS}$        | $\pm 12$   | V                  |
| Continuous drain current                    | $I_D$           | 7.5        | A                  |
|                                             |                 | 6          | A                  |
| Pulsed drain current                        | $I_{DM}$        | 30         | A                  |
| Power dissipation                           | $P_D$           | 1.5        | W                  |
|                                             |                 | 0.96       | W                  |
| Thermal resistance from Junction to ambient | $R_{\theta JA}$ | 120        | $^\circ\text{C/W}$ |
| Thermal resistance from Junction to Lead    | $R_{\theta JL}$ | 70         | $^\circ\text{C/W}$ |
| Junction temperature                        | $T_J$           | 150        | $^\circ\text{C}$   |
| Storage temperature                         | $T_{STG}$       | -55 ~ +150 | $^\circ\text{C}$   |

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

| Parameter                          | Symbol          | Min      | Typ  | Max      | Unit       | Conditions                                                |
|------------------------------------|-----------------|----------|------|----------|------------|-----------------------------------------------------------|
| Drain-Source breakdown voltage     | $V_{(BR)DSS}^*$ | 20       |      |          | V          | $V_{GS}=0V, I_D=250\mu A$                                 |
| Zero gate voltage drain current    | $I_{DSS}^*$     |          |      | 1        | $\mu A$    | $V_{DS}=16V, V_{GS}=0V$                                   |
| Gate-body leakage current          | $I_{GSS}^*$     |          |      | $\pm 10$ | $\mu A$    | $V_{DS}=0V, V_{GS}=\pm 10V$                               |
| Gate-threshold voltage             | $V_{GS(th)}^*$  | 0.5      | 0.71 | 1        | V          | $V_{DS}=V_{GS}, I_D=250\mu A$                             |
| Gate-Source Breakdown Voltage      | $BV_{GSO}$      | $\pm 12$ |      |          | V          | $V_{DS}=0V, I_G=\pm 250\mu A$                             |
| On-State Drain Current             | $I_{D(ON)}^*$   | 30       |      |          | A          | $V_{DS}=5V, V_{GS}=4.5V$                                  |
| Drain-source on-resistance         | $R_{DS(ON)}^*$  | 10       | 13   | 16       | m $\Omega$ | $V_{GS}=10V, I_D=7.5A$                                    |
|                                    |                 | 14       | 18   | 22       | m $\Omega$ | $V_{GS}=10V, I_D=7.5A, T_J=125^\circ\text{C}$             |
|                                    |                 | 11.5     | 15   | 18       | m $\Omega$ | $V_{GS}=4.5V, I_D=7A$                                     |
|                                    |                 | 13       | 16.8 | 20       | m $\Omega$ | $V_{GS}=3.6V, I_D=6A$                                     |
|                                    |                 | 15       | 19   | 24       | m $\Omega$ | $V_{GS}=2.5V, I_D=6A$                                     |
|                                    |                 | 20       | 26   | 34       | m $\Omega$ | $V_{GS}=1.8V, I_D=5A$                                     |
| Forward transconductance           | $g_{FS}$        |          | 30   |          | S          | $V_{DS}=5V, I_D=7A$                                       |
| Diode forward voltage              | $V_{SD}$        |          | 0.74 | 1        | V          | $I_S=1A, V_{GS}=0V$                                       |
| Diode forward current              | $I_S$           |          |      | 2.5      | A          |                                                           |
| Input capacitance                  | $C_{iss}$       |          | 1390 |          | pF         | $V_{DS}=10V, V_{GS}=0V, f=1\text{MHz}$                    |
| Output capacitance                 | $C_{oss}$       |          | 190  |          | pF         |                                                           |
| Reverse transfer capacitance       | $C_{rss}$       |          | 150  |          | pF         |                                                           |
| Gate resistance                    | $R_g$           |          | 1.5  |          | $\Omega$   | $V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$                     |
| Total gate charge                  | $Q_g$           |          | 15.4 |          | nC         | $V_{GS}=4.5V, V_{DS}=10V, I_D=7.5A$                       |
| Gate-source charge                 | $Q_{gs}$        |          | 1.4  |          | nC         |                                                           |
| Gate-drain charge                  | $Q_{gd}$        |          | 4    |          | nC         |                                                           |
| Turn-on delay time                 | $t_{d(on)}$     |          | 6.2  |          | nS         | $V_{GS}=4.5V, V_{DS}=10V, R_{GEN}=3\Omega, R_L=1.3\Omega$ |
| Turn-on rise time                  | $t_r$           |          | 11   |          | nS         |                                                           |
| Turn-off delay time                | $t_{d(off)}$    |          | 40.5 |          | nS         |                                                           |
| Turn-off fall time                 | $t_f$           |          | 10   |          | nS         |                                                           |
| Body Diode Reverse Recovery Time   | $t_{rr}$        |          | 15   |          | nS         | $I_F=7.5A, dI/dt=100A/\mu s$                              |
| Body Diode Reverse Recovery Charge | $Q_{rr}$        |          | 5.1  |          | nC         | $I_F=7.5A, dI/dt=100A/\mu s$                              |

\*Pulse test ; Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 0.5\%$  .

## DUAL N-CHANNEL ENHANCEMENT MODE FET

### TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

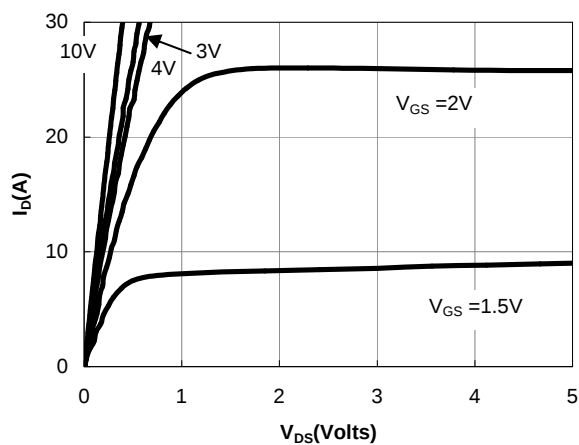


Figure 1: On-Regions Characteristics

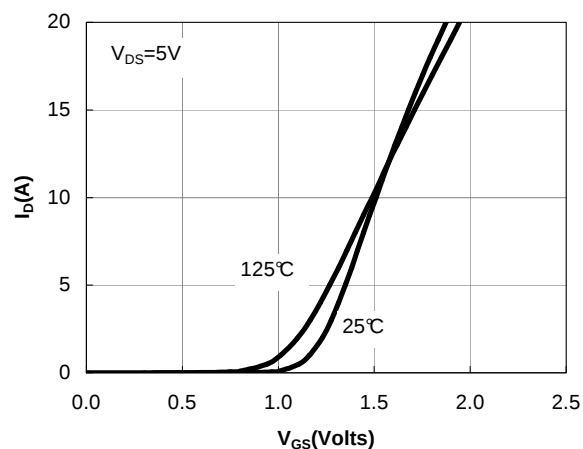


Figure 2: Transfer Characteristics

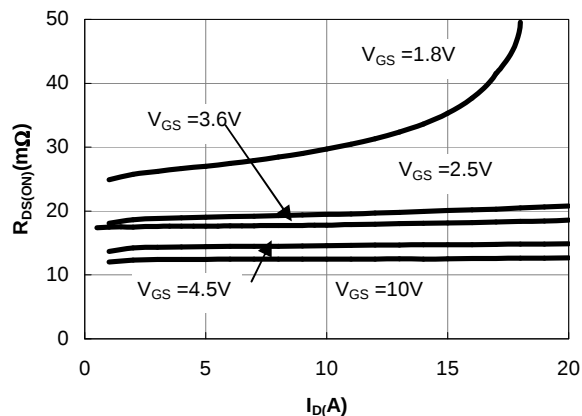


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

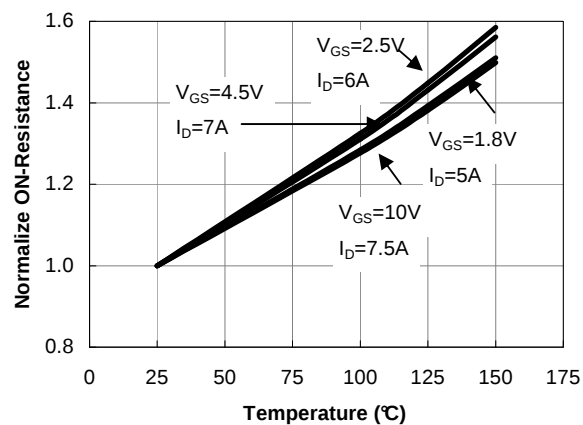


Figure 4: On-Resistance vs. Junction Temperature

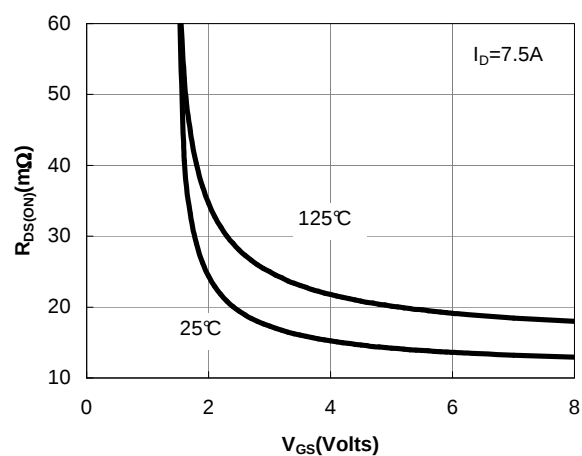


Figure 5: On-Resistance vs. Gate-Source Voltage

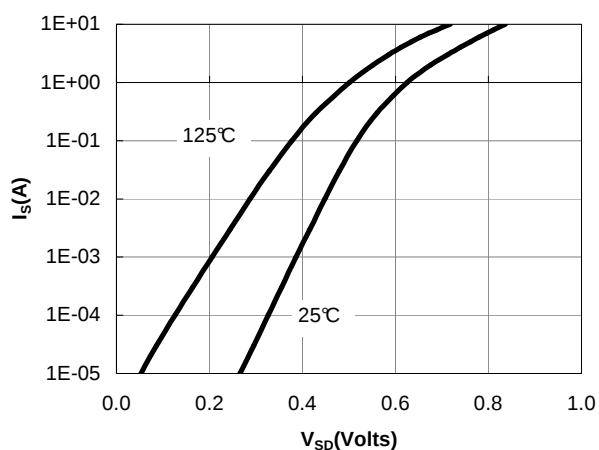


Figure 6: Body-Diode Characteristics

## DUAL N-CHANNEL ENHANCEMENT MODE FET

### TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

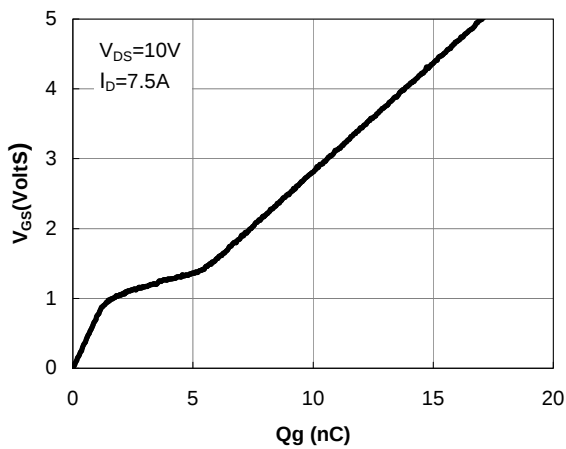


Figure 7: Gate-Charge Characteristics

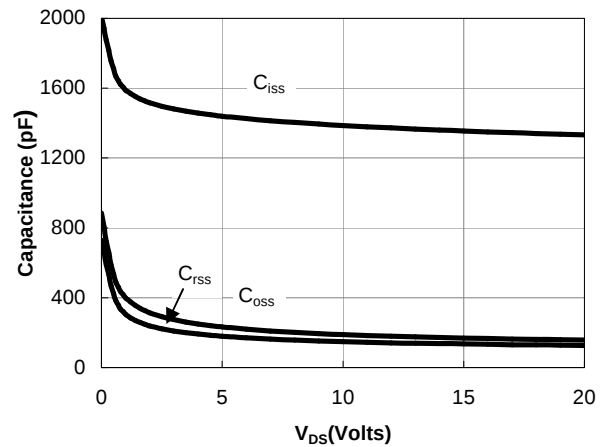


Figure 8: Capacitance Characteristics

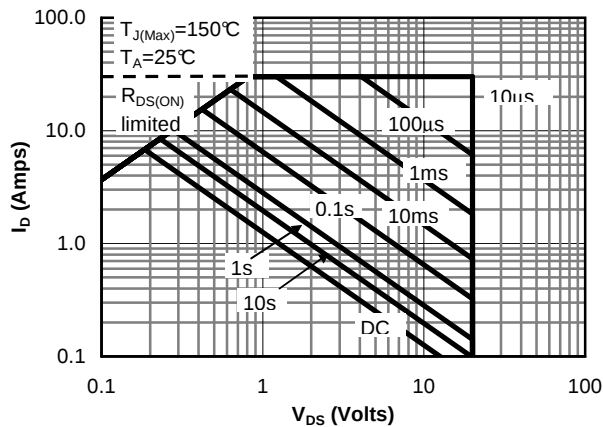


Figure 9: Maximum Forward Biased Safe Operating Area

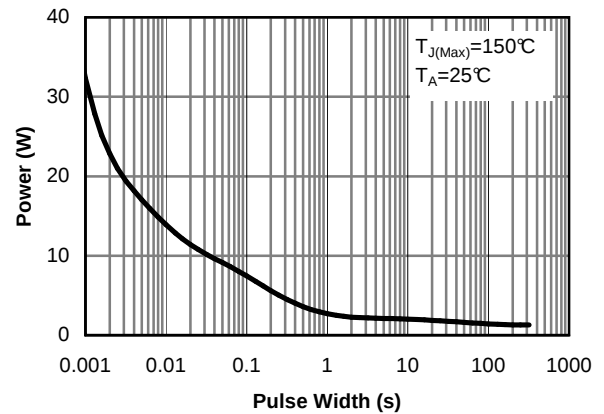


Figure 10: Single Pulse Power Rating Junction-to-Ambient

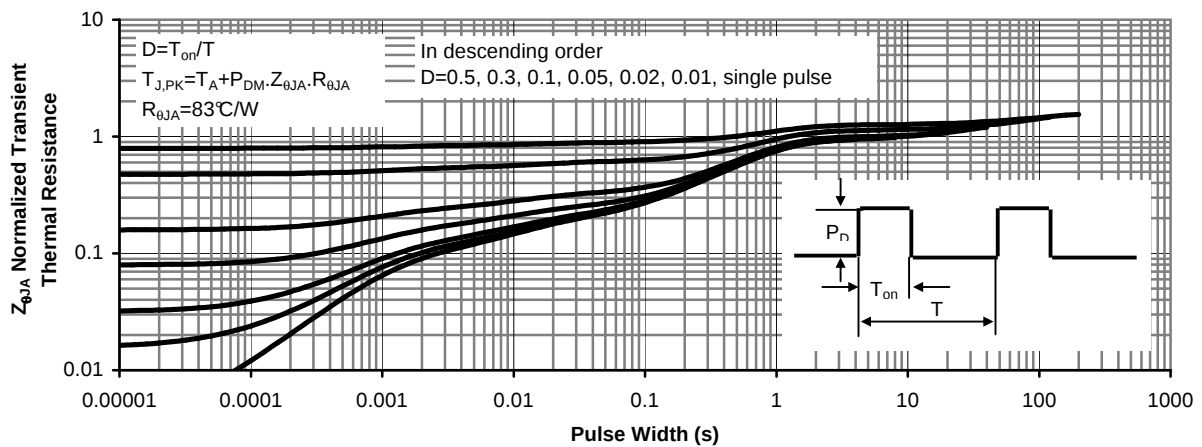
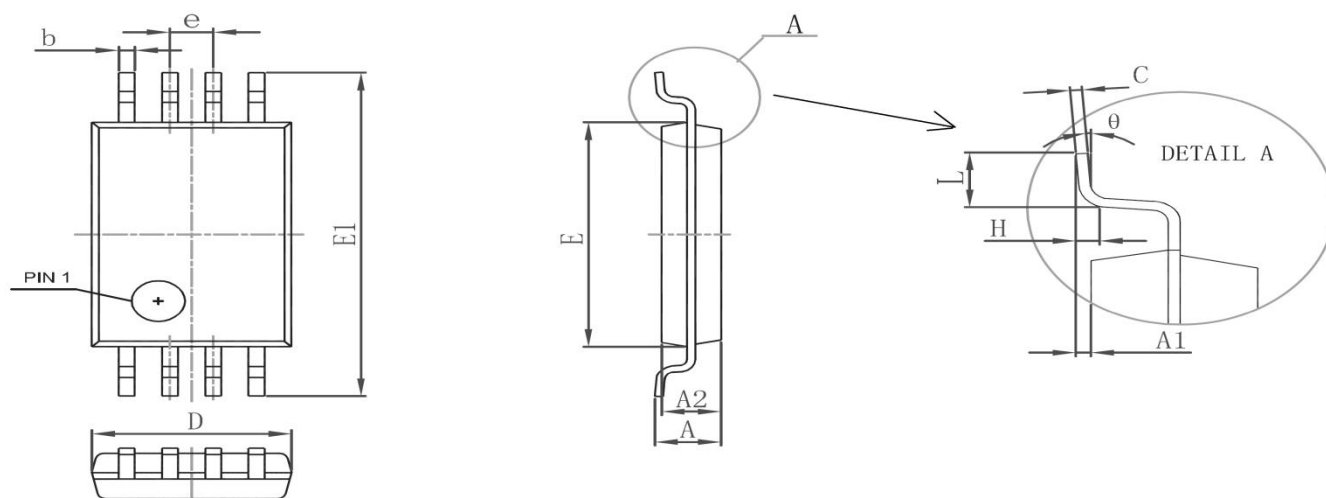


Figure 11: Normalized Maximum Transient Thermal Impedance

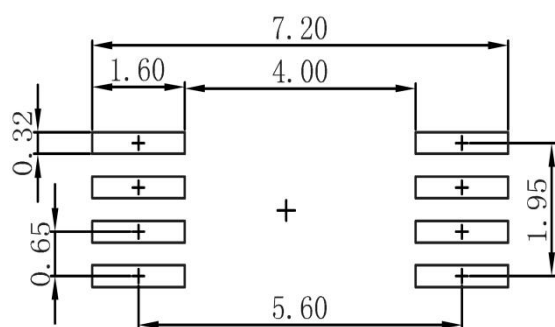
## DUAL N-CHANNEL ENHANCEMENT MODE FET

### SOP-8 Package Outline Dimensions



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| D      | 2.900                     | 3.100 | 0.114                | 0.122 |
| E      | 4.300                     | 4.500 | 0.169                | 0.177 |
| b      | 0.190                     | 0.300 | 0.007                | 0.012 |
| c      | 0.090                     | 0.200 | 0.004                | 0.008 |
| E1     | 6.250                     | 6.550 | 0.246                | 0.258 |
| A      |                           | 1.200 |                      | 0.047 |
| A2     | 0.800                     | 1.000 | 0.031                | 0.039 |
| A1     | 0.050                     | 0.150 | 0.002                | 0.006 |
| e      | 0.65(BSC)                 |       | 0.026(BSC)           |       |
| L      | 0.500                     | 0.700 | 0.020                | 0.028 |
| H      | 0.25(TYP)                 |       | 0.01(TYP)            |       |
| θ      | 1°                        | 7°    | 1°                   | 7°    |

### SOP-8 Suggested Pad Layout



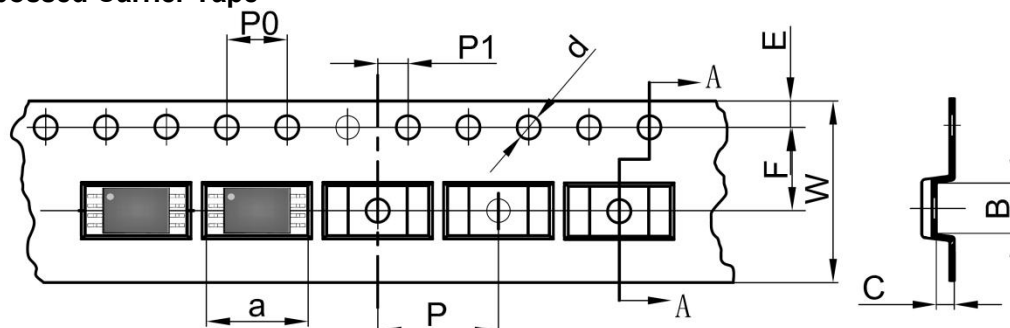
#### Note:

1. Controlling dimension: in millimeters
2. General tolerance:  $\pm 0.05\text{mm}$
3. The pad layout is for reference purposes only

## DUAL N-CHANNEL ENHANCEMENT MODE FET

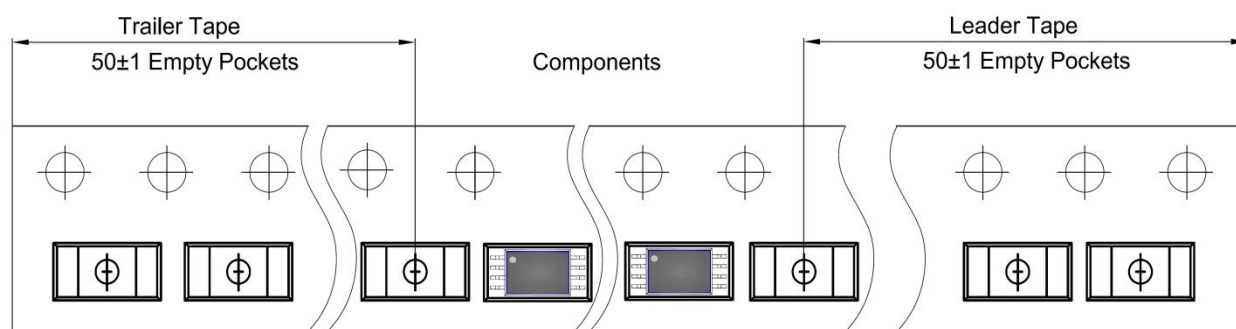
### SOP-8 Tape and Reel

#### SOP-8 Embossed Carrier Tape

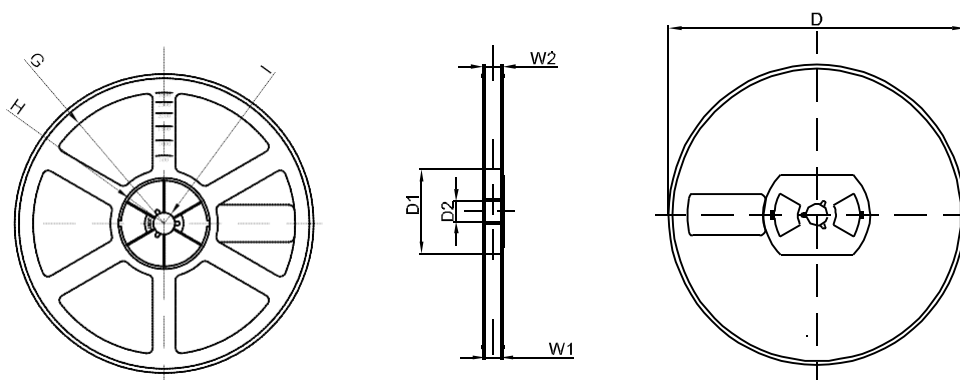


| DIMENSIONS ARE IN MILLIMETER |      |      |      |       |      |      |      |      |      |       |
|------------------------------|------|------|------|-------|------|------|------|------|------|-------|
| TYPE                         | a    | B    | C    | d     | E    | F    | P0   | P    | P1   | W     |
| SOP-8                        | 6.76 | 3.30 | 1.20 | Ø1.50 | 1.75 | 5.50 | 4.00 | 8.00 | 2.00 | 12.00 |
| TOLERANCE                    | ±0.1 | ±0.1 | ±0.1 | ±0.1  | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1  |

#### SOP-8 Tape Leader and Trailer



#### SOP-8 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 |
| TOLERANCE                    | ±2      | ±1     | ±1    | ±1      | ±1     | ±1    | ±1    | ±1    |