

## P-Channel Logic Level Enhancement Mode Field Effect Transistor

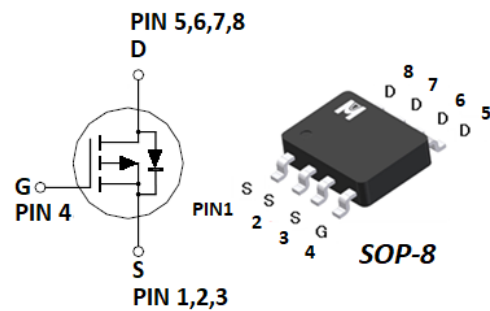
### Product Summary:

|                     |               |
|---------------------|---------------|
| $BV_{DSS}$          | -30V          |
| $R_{DS(on)}$ (MAX.) | 14 m $\Omega$ |
| $I_D$               | -12A          |

P Channel MOSFET

UIS, Rg 100% Tested

RoHS & Halogen Free & TSCA Compliant



### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

| PARAMETERS/TEST CONDITIONS                     |                                                                | SYMBOL         | LIMITS     | UNIT             |
|------------------------------------------------|----------------------------------------------------------------|----------------|------------|------------------|
| Gate-Source Voltage                            |                                                                | $V_{GS}$       | $\pm 25$   | V                |
| Continuous Drain Current                       | $T_A = 25^\circ\text{C}$                                       | $I_D$          | -12        | A                |
|                                                | $T_A = 100^\circ\text{C}$                                      |                | -9         |                  |
| Pulsed Drain Current <sup>1</sup>              |                                                                | $I_{DM}$       | -48        |                  |
| Avalanche Current                              |                                                                | $I_{AS}$       | -19        |                  |
| Avalanche Energy                               | $L = 0.1\text{mH}$ , $I_{AS} = -19\text{A}$ , $R_G = 25\Omega$ | $E_{AS}$       | 18         | mJ               |
| Power Dissipation                              | $T_A = 25^\circ\text{C}$                                       | $P_D$          | 2.5        | W                |
|                                                | $T_A = 100^\circ\text{C}$                                      |                | 1          |                  |
| Operating Junction & Storage Temperature Range |                                                                | $T_J, T_{stg}$ | -55 to 150 | $^\circ\text{C}$ |

### THERMAL RESISTANCE RATINGS

| THERMAL RESISTANCE               | SYMBOL          | TYPICAL | MAXIMUM | UNIT                      |
|----------------------------------|-----------------|---------|---------|---------------------------|
| Junction-to-Case                 | $R_{\theta JC}$ |         | 25      | $^\circ\text{C}/\text{W}$ |
| Junction-to-Ambient <sup>3</sup> | $R_{\theta JA}$ |         | 60.53   |                           |

<sup>1</sup>Pulse width limited by maximum junction temperature.

<sup>2</sup>Duty cycle  $\leq 1\%$

<sup>3</sup>The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ\text{C}$ .

<sup>4</sup>Guarantee by Engineering test.

ELECTRICAL CHARACTERISTICS ( $T_J = 25\text{ }^{\circ}\text{C}$ , Unless Otherwise Noted)

| PARAMETER                                                               | SYMBOL              | TEST CONDITIONS                                                    | LIMITS |      |           | UNIT       |
|-------------------------------------------------------------------------|---------------------|--------------------------------------------------------------------|--------|------|-----------|------------|
|                                                                         |                     |                                                                    | MIN    | TYP  | MAX       |            |
| STATIC                                                                  |                     |                                                                    |        |      |           |            |
| Drain-Source Breakdown Voltage                                          | $V_{(BR)DSS}$       | $V_{GS} = 0V, I_D = -250\mu A$                                     | -30    |      |           | V          |
| Gate Threshold Voltage                                                  | $V_{GS(th)}$        | $V_{DS} = V_{GS}, I_D = -250\mu A$                                 | -1     | -1.5 | -3        |            |
| Gate-Body Leakage                                                       | $I_{GSS}$           | $V_{DS} = 0V, V_{GS} = \pm 20V$                                    |        |      | $\pm 100$ | nA         |
|                                                                         |                     | $V_{DS} = 0V, V_{GS} = \pm 25V$                                    |        |      | $\pm 500$ |            |
| Zero Gate Voltage Drain Current                                         | $I_{DSS}$           | $V_{DS} = -24V, V_{GS} = 0V$                                       |        |      | -1        | $\mu A$    |
|                                                                         |                     | $V_{DS} = -20V, V_{GS} = 0V, T_J = 125\text{ }^{\circ}C$           |        |      | -10       |            |
| On-State Drain Current <sup>1</sup>                                     | $I_{D(ON)}$         | $V_{DS} = -5V, V_{GS} = -10V$                                      | -12    |      |           | A          |
| Drain-Source On-State Resistance <sup>1</sup>                           | $R_{DS(ON)}$        | $V_{GS} = -10V, I_D = -12A$                                        |        | 12   | 14        | m $\Omega$ |
|                                                                         |                     | $V_{GS} = -4.5V, I_D = -9A$                                        |        | 17   | 21        |            |
| Forward Transconductance <sup>1</sup>                                   | $g_{fs}$            | $V_{DS} = -5V, I_D = -12A$                                         |        | 28   |           | S          |
| DYNAMIC                                                                 |                     |                                                                    |        |      |           |            |
| Input Capacitance                                                       | $C_{iss}$           | $V_{GS} = 0V, V_{DS} = -15V, f = 1MHz$                             |        | 2270 |           | pF         |
| Output Capacitance                                                      | $C_{oss}$           |                                                                    |        | 342  |           |            |
| Reverse Transfer Capacitance                                            | $C_{rss}$           |                                                                    |        | 300  |           |            |
| Gate Resistance                                                         | $R_g$               | $V_{GS} = 15mV, V_{DS} = 0V, f = 1MHz$                             |        | 3.7  |           | $\Omega$   |
| Total Gate Charge <sup>1,2</sup>                                        | $Q_g(V_{GS}=-10V)$  | $V_{DS} = -15V, V_{GS} = -10V,$<br>$I_D = -12A$                    |        | 39.3 |           | nC         |
|                                                                         | $Q_g(V_{GS}=-4.5V)$ |                                                                    |        | 16   |           |            |
| Gate-Source Charge <sup>1,2</sup>                                       | $Q_{gs}$            |                                                                    |        | 4.9  |           |            |
| Gate-Drain Charge <sup>1,2</sup>                                        | $Q_{gd}$            |                                                                    |        | 7.5  |           |            |
| Turn-On Delay Time <sup>1,2</sup>                                       | $t_{d(on)}$         | $V_{DS} = -15V,$<br>$I_D = -1A, V_{GS} = -10V, R_{GS} = 2.7\Omega$ |        | 20   |           | nS         |
| Rise Time <sup>1,2</sup>                                                | $t_r$               |                                                                    |        | 12   |           |            |
| Turn-Off Delay Time <sup>1,2</sup>                                      | $t_{d(off)}$        |                                                                    |        | 55   |           |            |
| Fall Time <sup>1,2</sup>                                                | $t_f$               |                                                                    |        | 15   |           |            |
| SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T <sub>c</sub> = 25 °C) |                     |                                                                    |        |      |           |            |
| Continuous Current                                                      | $I_S$               |                                                                    |        |      | -3.6      | A          |
| Pulsed Current <sup>3</sup>                                             | $I_{SM}$            |                                                                    |        |      | -14.4     |            |
| Forward Voltage <sup>1</sup>                                            | $V_{SD}$            | $I_F = I_S, V_{GS} = 0V$                                           |        |      | -1.2      | V          |
| Reverse Recovery Time                                                   | $t_{rr}$            | $I_F = I_S, dI_F/dt = 100A / \mu S$                                |        | 52   |           | nS         |
| Reverse Recovery Charge                                                 | $Q_{rr}$            |                                                                    |        | 60   |           | nC         |



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*Excelliance MOS Corporation*

**EMB14P03G**

<sup>1</sup>Pulse test : Pulse Width  $\leq 300 \mu\text{sec}$ , Duty Cycle  $\leq 2\%$ .

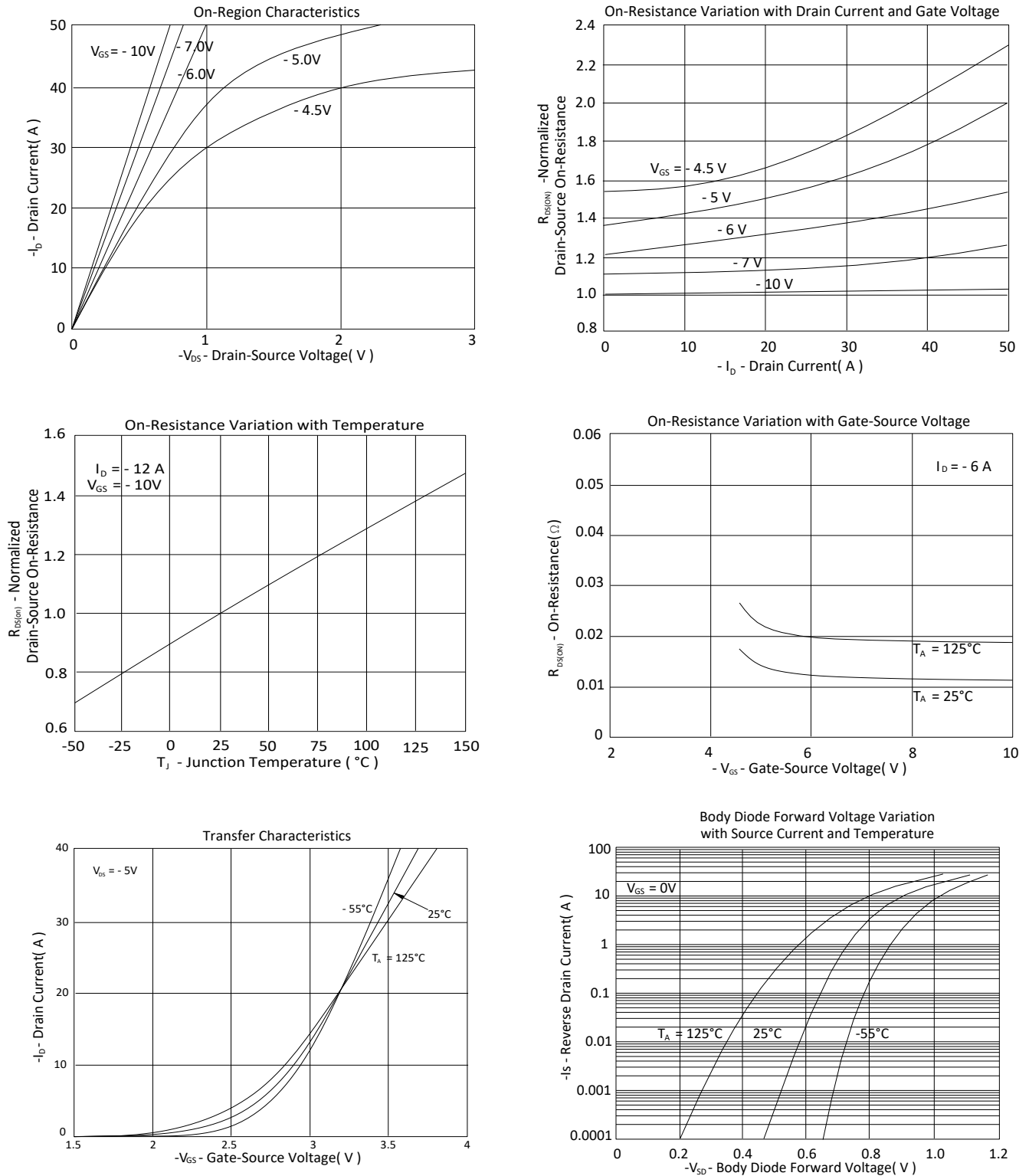
<sup>2</sup>Independent of operating temperature.

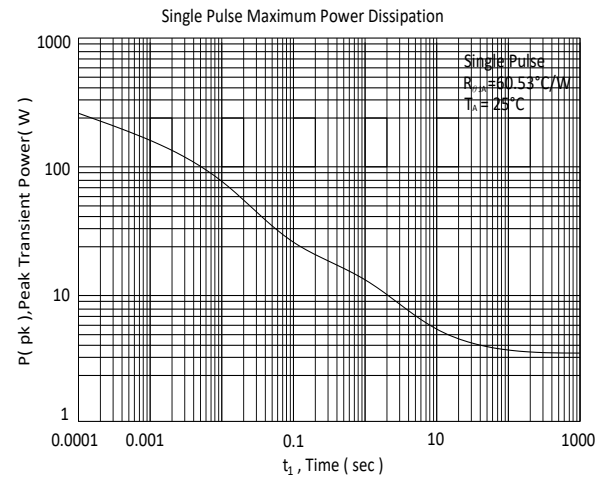
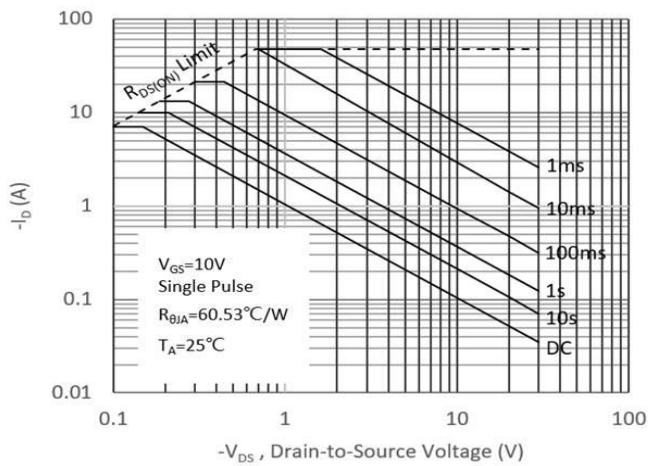
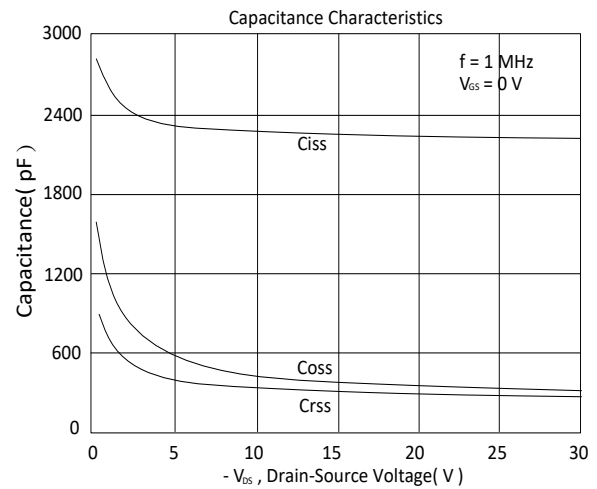
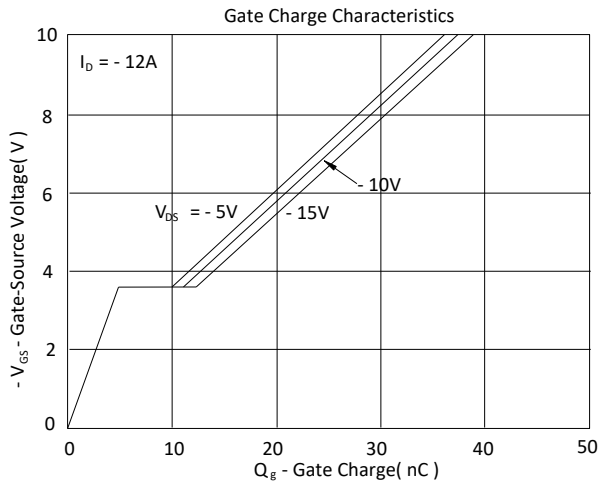
<sup>3</sup>Pulse width limited by maximum junction temperature.

**EMC will review datasheet by quarter, and update new version.**



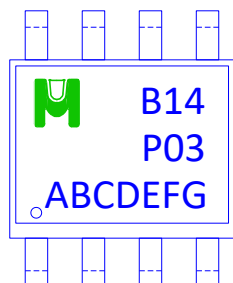
TYPICAL CHARACTERISTICS





### Ordering & Marking Information:

Device Name: EMB14P03G for SOP-8



→ B14P03: Device Name

→ ABCDEFGH: Date Code

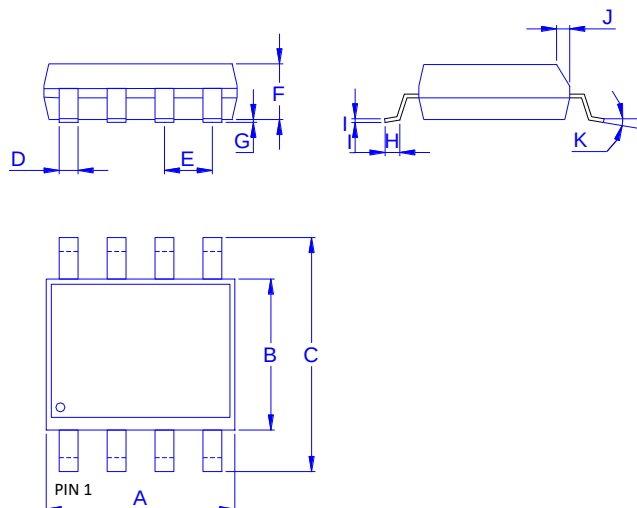
A: Assembly House

B: Year(A:2008 B:2009 C:2010....)

C: Month(A:01 B:02 C:03 D:04 E:05 F:06 G:07 H:08 I:09 J:10 K:11 L:12)

DEFG: Serial No.

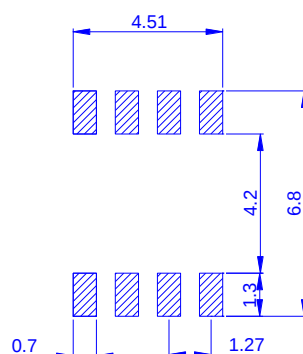
### Outline Drawing



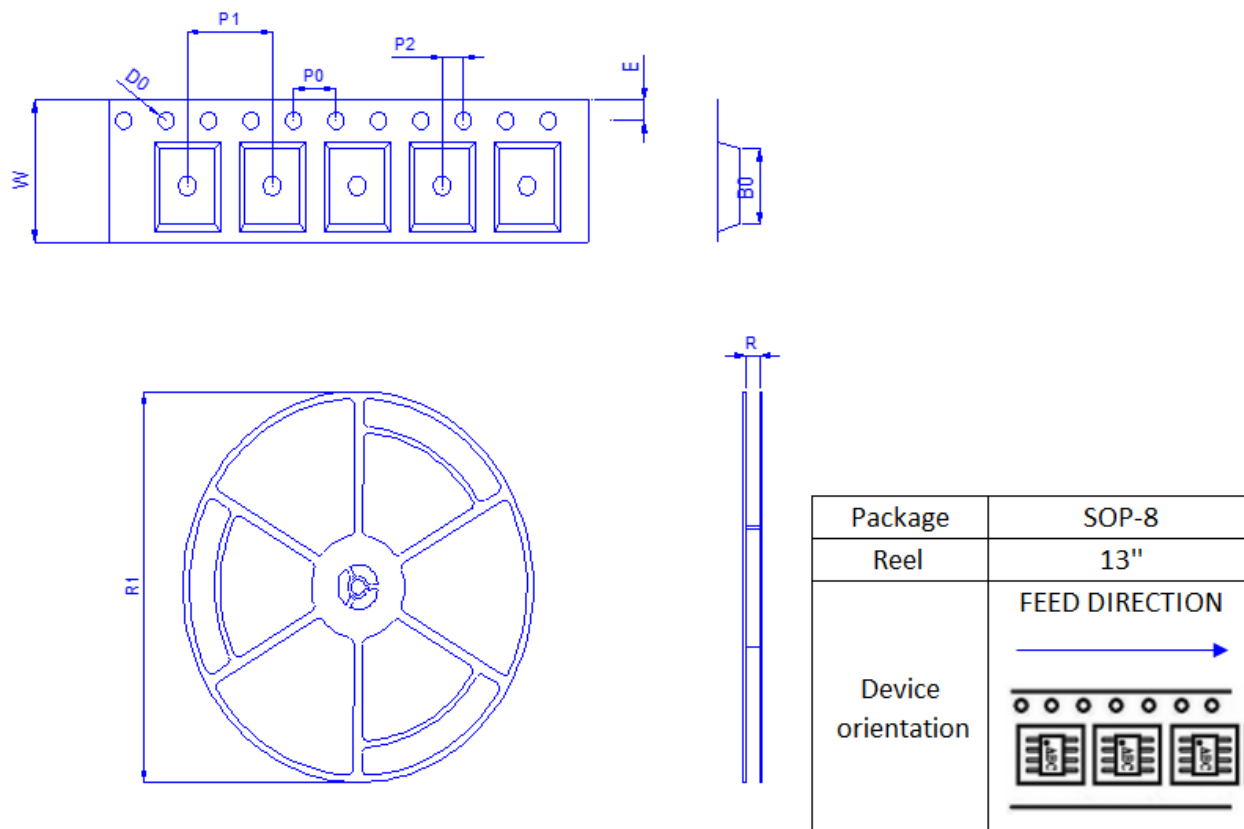
### Dimension in mm

| Dimension | A    | B    | C    | D    | E    | F    | G    | H    | I    | J    | K  |
|-----------|------|------|------|------|------|------|------|------|------|------|----|
| Min.      | 4.70 | 3.80 | 5.80 | 0.31 |      | 1.35 | 0.01 | 0.40 | 0.10 | 0.25 | 0° |
| Typ.      | 4.90 | 3.90 | 6.00 | 0.41 | 1.27 | 1.55 | 0.18 | 0.60 | 0.20 | 0.30 |    |
| Max.      | 5.10 | 4.00 | 6.20 | 0.51 |      | 1.75 | 0.25 | 1.27 | 0.25 | 0.50 | 8° |

### Footprint



Tape&Reel Information:2500pcs/Reel



Dimension in mm

| Dimension | Carrier tape |     |      |     |     |     |     | Reel |     |
|-----------|--------------|-----|------|-----|-----|-----|-----|------|-----|
|           | B0           | D0  | E    | P0  | P1  | P2  | W   | R    | R1  |
| Typ.      | 6.5          | 1.5 | 1.75 | 4   | 8   | 2   | 12  | 12.4 | 330 |
| ±         | 0.4          | 0.2 | 0.2  | 0.2 | 0.2 | 0.2 | 0.5 | REF  | REF |