

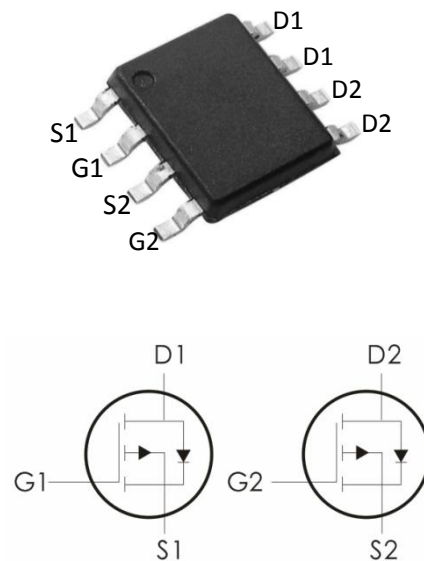
## Description:

This Dual P-Channel MOSFET uses advanced trench technology and design to provide excellent  $R_{DS(on)}$  with low gate charge.

It can be used in a wide variety of applications.

## Features:

- 1)  $V_{DS}=-30V, I_D=-8A, R_{DS(on)}<16m\Omega @V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low  $R_{DS(on)}$ .
- 5) Excellent package for good heat dissipation.



## Package Marking and Ordering Information:

| Part NO. | Marking | Package | Quantity      |
|----------|---------|---------|---------------|
| SC016DPG | C016DP  | SOP-8D  | 3000 pcs/Reel |

## Absolute Maximum Ratings: ( $T_A=25^{\circ}C$ unless otherwise noted)

| Symbol         | Parameter                                        | Ratings     | Units       |
|----------------|--------------------------------------------------|-------------|-------------|
| $V_{DS}$       | Drain-Source Voltage                             | -30         | V           |
| $V_{GS}$       | Gate-Source Voltage                              | $\pm 20$    | V           |
| $I_D$          | Continuous Drain Current                         | -8          | A           |
|                | Continuous Drain Current- $T_A=100^{\circ}C^1$   | -5.8        |             |
| $I_{DM}$       | Pulsed Drain Current <sup>1</sup>                | -35         | A           |
| $E_{AS}$       | Single Pulse Avalanche Energy <sup>2</sup>       | 29          | mJ          |
| $P_D$          | Power Dissipation                                | 2.5         | W           |
| $T_J, T_{STG}$ | Operating and Storage Junction Temperature Range | -55 to +150 | $^{\circ}C$ |

## Thermal Characteristics:

| Symbol          | Parameter                               | Max | Units         |
|-----------------|-----------------------------------------|-----|---------------|
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 50  | $^{\circ}C/W$ |

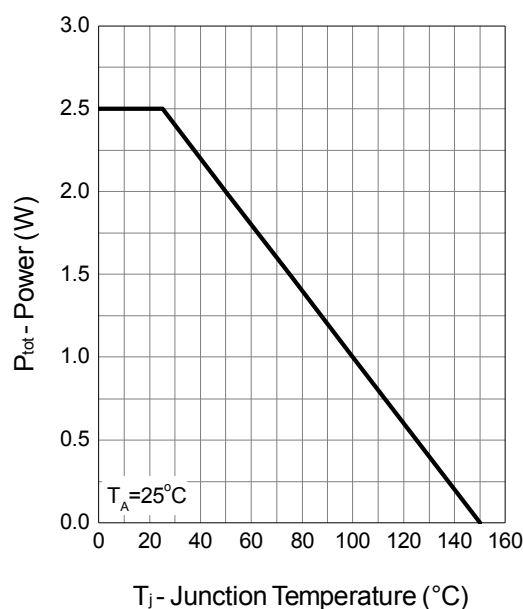
## Electrical Characteristics: ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)

| Symbol                             | Parameter                                       | Conditions                                                                                  | Min | Typ   | Max   | Units |
|------------------------------------|-------------------------------------------------|---------------------------------------------------------------------------------------------|-----|-------|-------|-------|
| Off Characteristics                |                                                 |                                                                                             |     |       |       |       |
| BV <sub>DSS</sub>                  | Drain-Source Breakdown Voltage                  | V <sub>GS</sub> =-0V, I <sub>D</sub> =250 μ A                                               | -30 | ---   | ---   | V     |
| I <sub>DSS</sub>                   | Zero Gate Voltage Drain Current                 | V <sub>GS</sub> =0V, V <sub>DS</sub> =-30V                                                  | --- | ---   | -1    | μ A   |
| I <sub>GSS</sub>                   | Gate-Source Leakage Current                     | V <sub>GS</sub> =± 20V, V <sub>DS</sub> =0A                                                 | --- | ---   | ± 100 | nA    |
| On Characteristics                 |                                                 |                                                                                             |     |       |       |       |
| V <sub>GS(th)</sub>                | Gate -Source Threshold Voltage                  | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250 μ A                                  | -1  | -1.65 | -2.5  | V     |
| R <sub>DS(ON)</sub>                | Drain-Source On Resistance <sup>3</sup>         | V <sub>GS</sub> =-10V, I <sub>D</sub> =-8A                                                  | --- | 13    | 16    | m Ω   |
|                                    |                                                 | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-5.6A                                               | --- | 18    | 25    |       |
| Dynamic Characteristics            |                                                 |                                                                                             |     |       |       |       |
| C <sub>iss</sub>                   | Input Capacitance <sup>4</sup>                  | V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, f=1MHz                                          | --- | 1229  | ---   | pF    |
| C <sub>OSS</sub>                   | Output Capacitance <sup>4</sup>                 |                                                                                             | --- | 204   | ---   |       |
| C <sub>rss</sub>                   | Reverse Transfer Capacitance <sup>4</sup>       |                                                                                             | --- | 154   | ---   |       |
| Switching Characteristics          |                                                 |                                                                                             |     |       |       |       |
| t <sub>d(on)</sub>                 | Turn-On Delay Time <sup>4</sup>                 | V <sub>DD</sub> =-15V, I <sub>D</sub> =-1A,<br>R <sub>GEN</sub> =6 Ω .V <sub>GS</sub> =-10V | --- | 8.7   | ---   | ns    |
| t <sub>r</sub>                     | Rise Time <sup>4</sup>                          |                                                                                             | --- | 10.3  | ---   | ns    |
| t <sub>d(off)</sub>                | Turn-Off Delay Time <sup>4</sup>                |                                                                                             | --- | 35.1  | ---   | ns    |
| t <sub>f</sub>                     | Fall Time <sup>4</sup>                          |                                                                                             | --- | 46.7  | ---   | ns    |
| Q <sub>g</sub>                     | Total Gate Charge <sup>4</sup>                  | V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V,<br>I <sub>D</sub> =-8A                        | --- | 26    | ---   | nC    |
| Q <sub>gs</sub>                    | Gate-Source Charge <sup>4</sup>                 |                                                                                             | --- | 9     | ---   | nC    |
| Q <sub>gd</sub>                    | Gate-Drain “Miller” Charge <sup>4</sup>         |                                                                                             | --- | 5.6   | ---   | nC    |
| Drain-Source Diode Characteristics |                                                 |                                                                                             |     |       |       |       |
| V <sub>SD</sub>                    | Source-Drain Diode Forward Voltage <sup>3</sup> | V <sub>GS</sub> =0V, I <sub>S</sub> =-1A                                                    | --- | ---   | -1.2  | V     |
| I <sub>S</sub>                     | Continuous Source Current                       | V <sub>D</sub> =V <sub>G</sub> =0V                                                          | --- | ---   | -8    | A     |
| I <sub>SM</sub>                    | Pulsed Source Current                           | V <sub>D</sub> =V <sub>G</sub> =0V                                                          | --- | ---   | -5.8  | A     |
| T <sub>rr</sub>                    | Reverse Recovery Time <sup>4</sup>              | I <sub>SD</sub> =-8A,<br>dI <sub>SD</sub> /dt=100A/μs                                       | --- | 16.3  | ---   | NS    |
| Q <sub>rr</sub>                    | Reverse Recovery Charge <sup>4</sup>            |                                                                                             | --- | 5.9   | ---   | NC    |

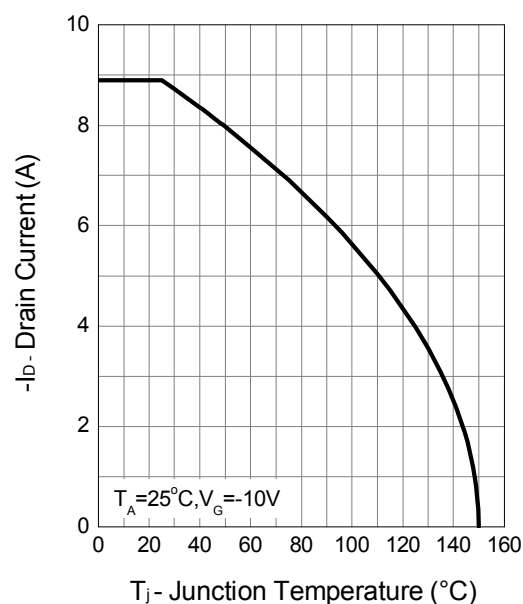
## Notes:

1. Pulse width is limited by maximum junction temperature.
2. UIS tested and pulse width are limited by maximum junction temperature 150°C (initial temperature  $T_J=25^\circ\text{C}$ ).
3. Pulse test; pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production testing.

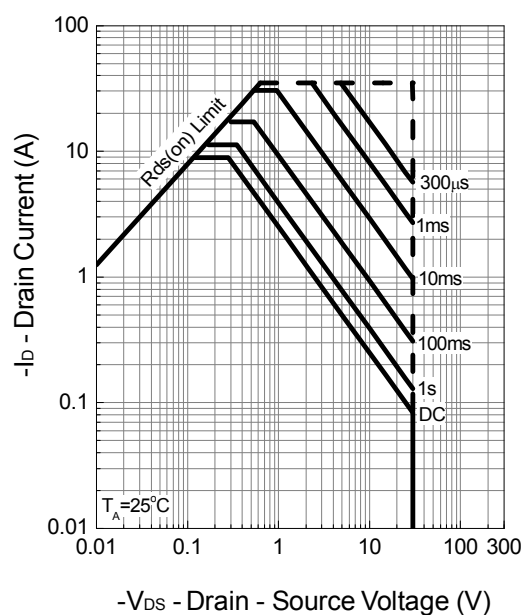
## Typical Characteristics: ( $T_A=25^\circ\text{C}$ unless otherwise noted)



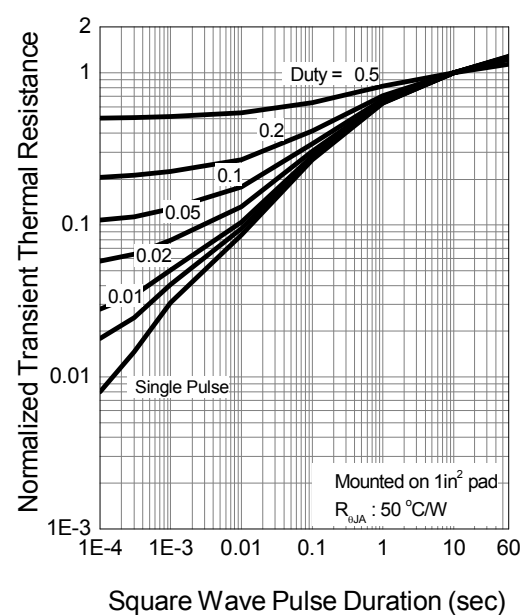
**Fig1. Power Dissipation**



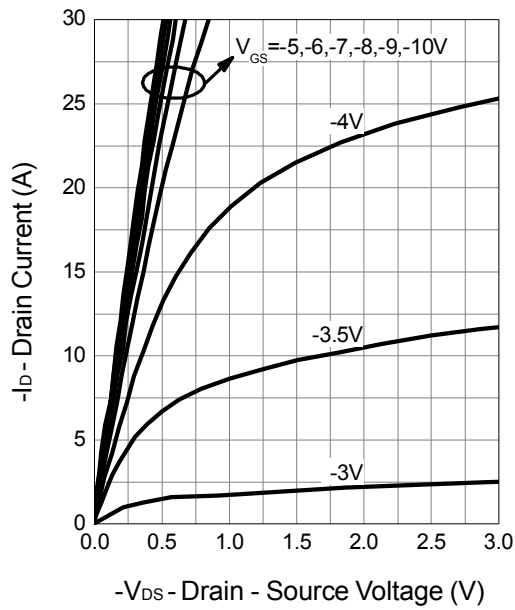
**Fig2. Drain Current**



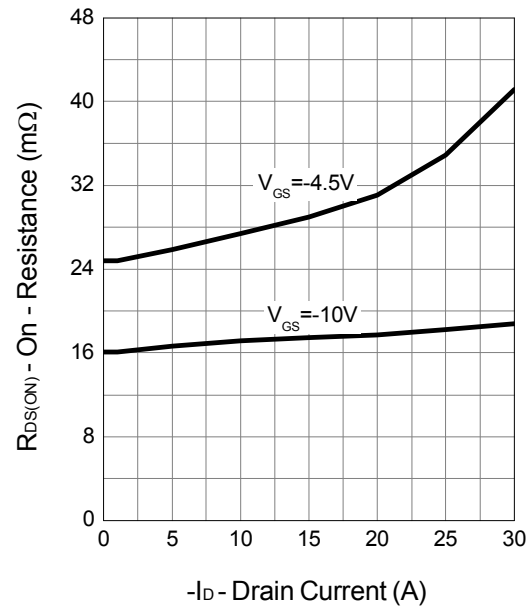
**Fig3. Safe Operation Area**



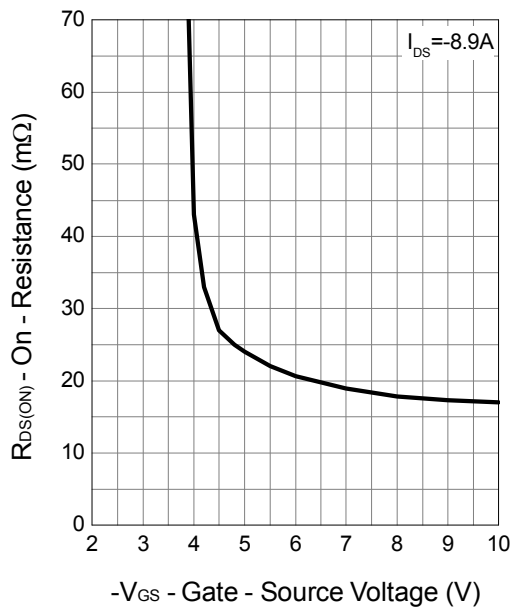
**Fig4. Thermal Transient Impedance**



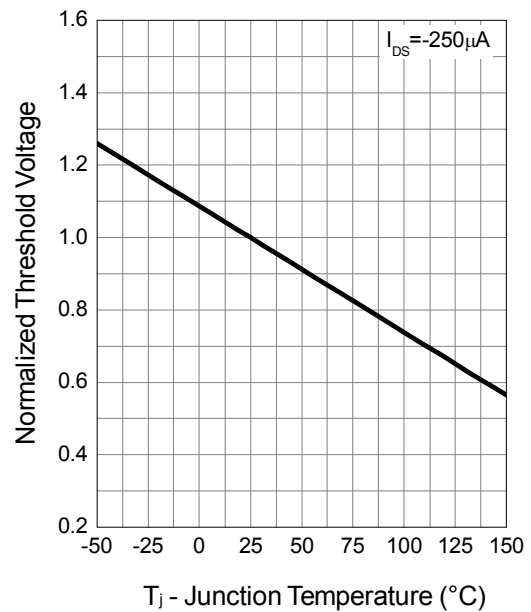
**Fig5. Output Characteristics**



**Fig6. Drain-Source On Resistance**



**Fig7. Gate-Source On Resistance**



**Fig8. Gate Threshold Voltage**

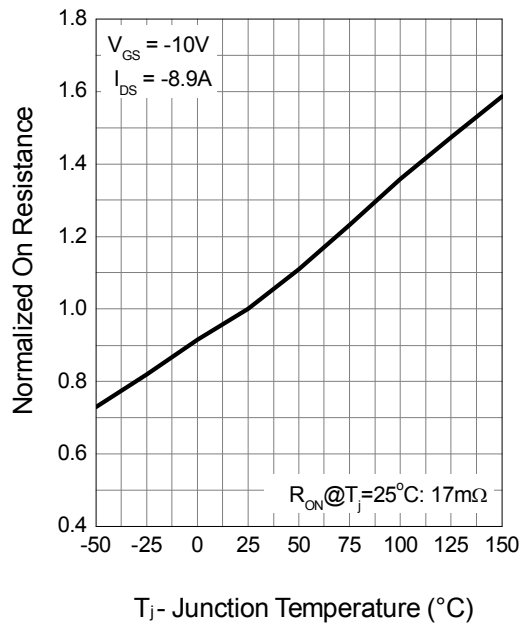


Fig9. Drain-Source On Resistance

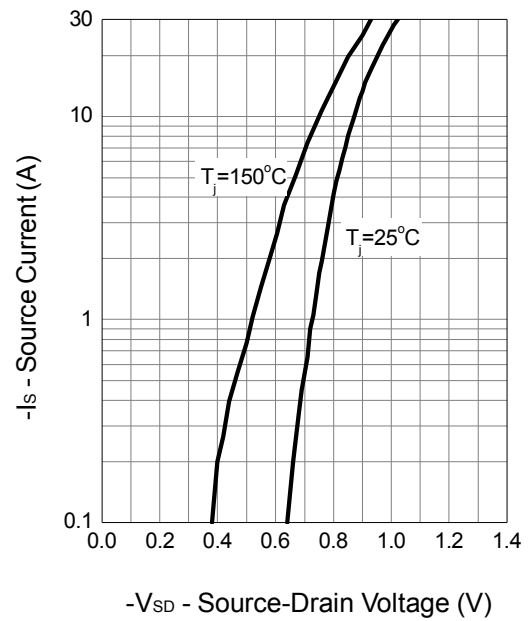


Fig10. Source-Drain Diode Forward

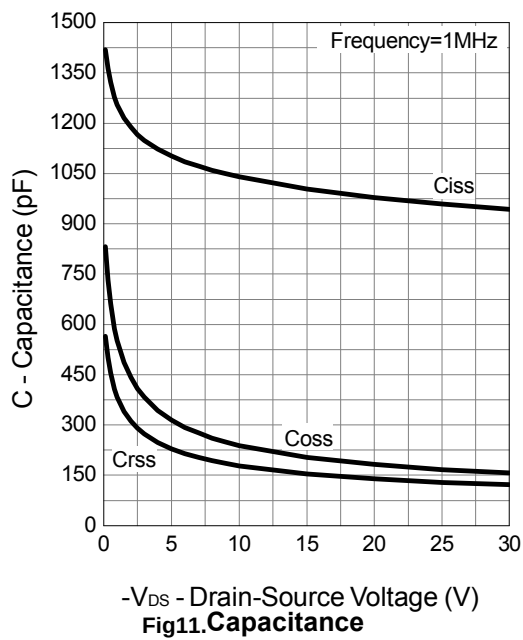


Fig11. Capacitance

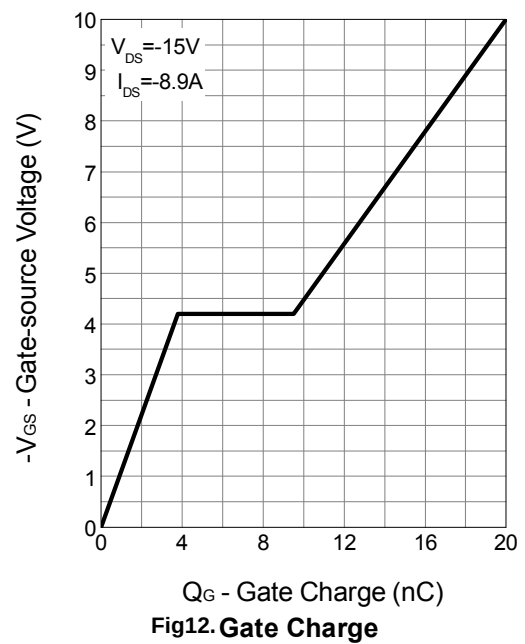
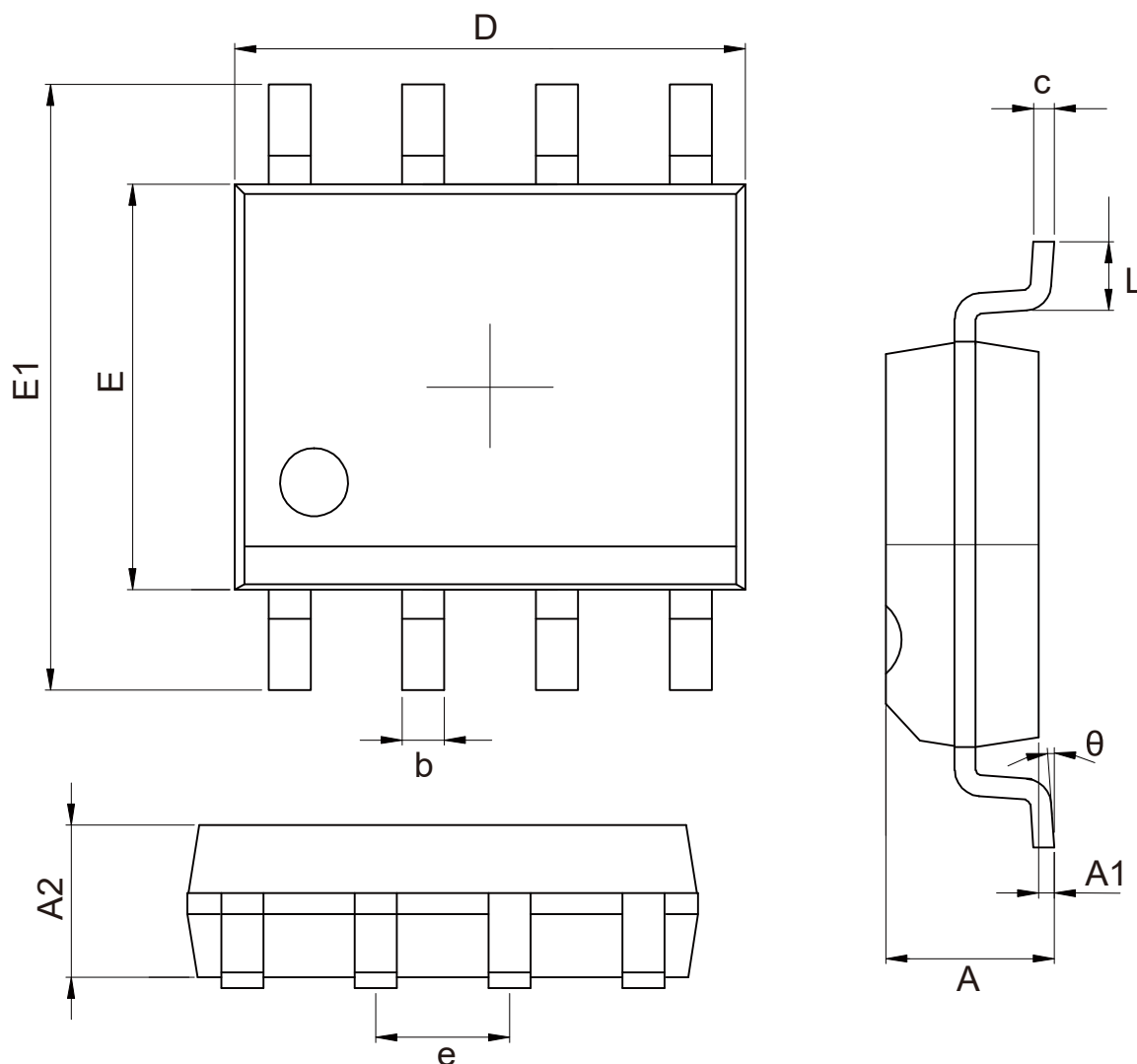


Fig12. Gate Charge

## SOP-8DPackage Information:



| COMMON DIMENSIONS         |          |       |       |
|---------------------------|----------|-------|-------|
| CUNITS MEASURE=MILLIMETER |          |       |       |
| SYMBOL                    | MIN      | NOM   | MAX   |
| A                         | 1.350    | —     | 1.750 |
| A1                        | 0.100    | —     | 0.250 |
| A2                        | 1.350    | —     | 1.550 |
| b                         | 0.330    | —     | 0.510 |
| c                         | 0.170    | —     | 0.250 |
| D                         | 4.700    | —     | 5.100 |
| E                         | 3.800    | 3.900 | 4.000 |
| E1                        | 5.800    | —     | 6.200 |
| e                         | 1.270BSC |       |       |
| L                         | 0.400    | —     | 1.270 |
| $\theta$                  | 0°       | —     | 8°    |

Unit:mm

## Marking Information:

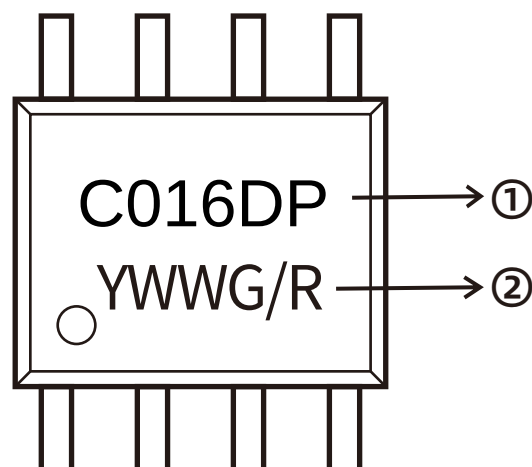
①: Part NO.

②: Date Code (YWWG / R)

Y: Year Code , last digit of the year

WW : Week Code (01-53)

G/R: G(Green) /R(Lead Free)



## Previous Version

| Version | Date       | Subjects (major changes since last revision) |
|---------|------------|----------------------------------------------|
| 1.0     | 2024-06-06 | Release of final version                     |

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