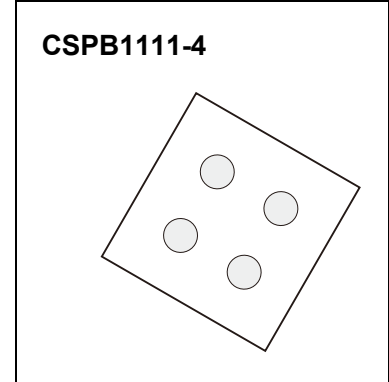




# CSP Enhancement Mode Power MOSFET

## CJ4502SP Dual N-Channel MOSFET

V <sub>SSS</sub>	R <sub>SS(on)</sub> TYP	I <sub>S</sub>
20V	22.6mΩ@4.5V	3.5A
	22.9mΩ@4.1V	
	23.1mΩ@4.0V	
	23.3mΩ@3.8V	
	23.6mΩ@3.7V	
	25.0mΩ@3.1V	
	27.7mΩ@2.5V	

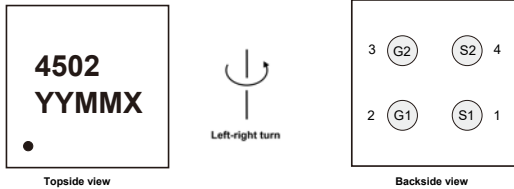


### DESCRIPTION

The CJ4502SP uses advanced trench technology to provide excellent R<sub>SS(ON)</sub>, low gate charge and operation with gate voltages as low as 2.5V while retaining a 12V V<sub>GS(MAX)</sub> rating. It is ESD protected.

This device is suitable for use as a unidirectional or bi-directional load switch, facilitated by its common-drain configuration.

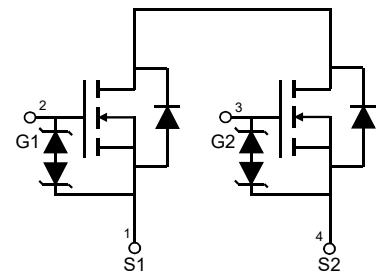
### Marking and pin assignment



Marking:

- |                       |           |
|-----------------------|-----------|
| 1. 4502: Product Code | 1 Source1 |
| 2. YYMMX: Date Code   | 2 Gate1   |
| 3. Solid dot: Pin 1   | 3 Gate2   |
|                       | 4 Source2 |

### Equivalent Circuit



### ABSOLUTE MAXIMUM RATINGS (T<sub>a</sub>=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Source to Source Voltage	V <sub>SSS</sub>	20	V
Gate-Source Voltage	V <sub>GSS</sub>	±12	V
Source Current(DC)	I <sub>S</sub> <sup>①</sup>	3.5	A
Source Current (Pulsed)	I <sub>SP</sub> <sup>①</sup>	35	A
Total Power Dissipation	P <sub>T</sub> <sup>①</sup>	2.5	W
Channel Temperature	T <sub>ch</sub>	150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 To 150	°C

# MOSFET ELECTRICAL CHARACTERISTICS

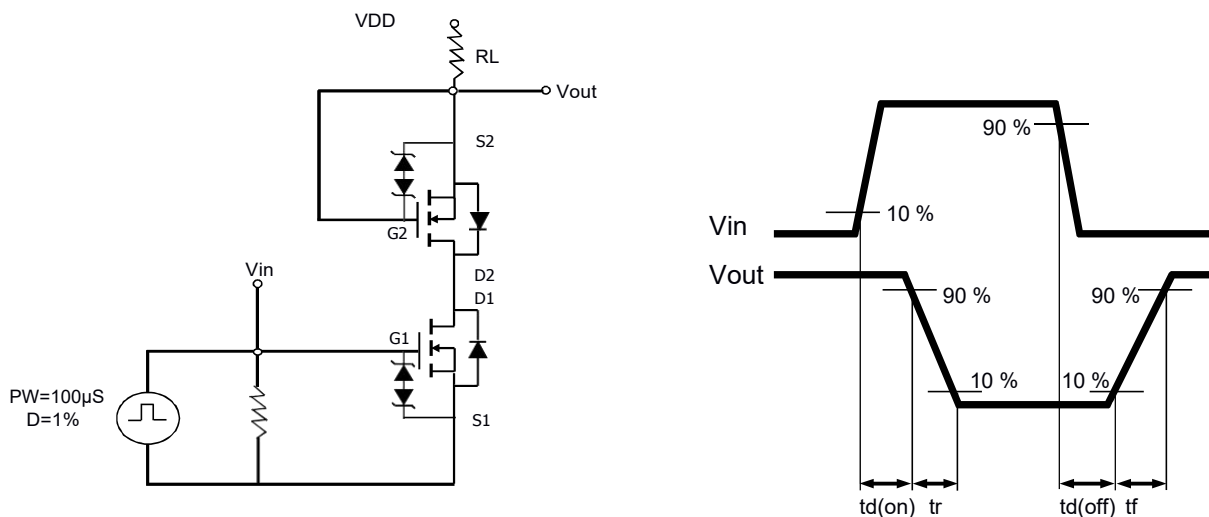
$T_a=25\text{ }^\circ\text{C}$  unless otherwise specified

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Static Parameters</b>						
Source to Source Breakdown Voltage	$BV_{SSS}$	$I_S=1\text{mA}, V_{GS}=0\text{V}$	20			V
Zero-Gate Voltage Source Current	$I_{SSS}$	$V_{SS}=16\text{V}, V_{GS}=0\text{V}$			1.0	$\mu\text{A}$
Gate to Source Leakage Current	$I_{GSS}$	$V_{SS}=0\text{V}, V_{GS}=\pm 10\text{V}$			$\pm 10$	$\mu\text{A}$
Gate to Source Threshold Voltage	$V_{GS(th)}$	$V_{SS}=V_{GS}, I_S=250\mu\text{A}$	0.5	0.80	1.3	V
Source to Source On-state Resistance	$R_{SS(on)}$	$V_{GS}=4.5\text{V}, I_S=2\text{A}$	15.8	22.6	31	$\text{m}\Omega$
		$V_{GS}=4.1\text{V}, I_S=2\text{A}$	16.0	22.9	33	$\text{m}\Omega$
		$V_{GS}=4.0\text{V}, I_S=2\text{A}$	16.2	23.1	34	$\text{m}\Omega$
		$V_{GS}=3.8\text{V}, I_S=2\text{A}$	16.3	23.3	35	$\text{m}\Omega$
		$V_{GS}=3.7\text{V}, I_S=2\text{A}$	16.5	23.6	36	$\text{m}\Omega$
		$V_{GS}=3.1\text{V}, I_S=2\text{A}$	17.5	25.0	39	$\text{m}\Omega$
		$V_{GS}=2.5\text{V}, I_S=2\text{A}$	19.4	27.7	48	$\text{m}\Omega$
Input Capacitance	$C_{iss}$	$V_{SS}=10\text{V}, V_{GS}=0\text{V}, f=1\text{kHz}$		644		pF
Output Capacitance	$C_{oss}$			150		pF
Reverse Transfer Capacitance	$C_{rss}$			109		pF
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=9\text{V}, R_L=2.8\Omega, V_{GS}=4.5\text{V}$		113		nS
Turn-on Rise Time	$t_r$			246		nS
Turn-off Delay Time	$t_{d(off)}$			1160		nS
Turn-off Fall Time	$t_f$			516		nS
Total Gate Charge	$Q_g$				8.6	
Gate1-source1 charge	$Q_{g1s1}$	$V_{SS}=10\text{V}, I_S=3.4\text{A}, V_{GS}=6\text{V}$		0.9		nC
Gate1-source2 charge	$Q_{g1s2}$			2.5		nC
Diode Forward Voltage	$V_{F(S-S)}$	$V_{GS}=0\text{V}, I_S=2\text{A}$			1.0	V

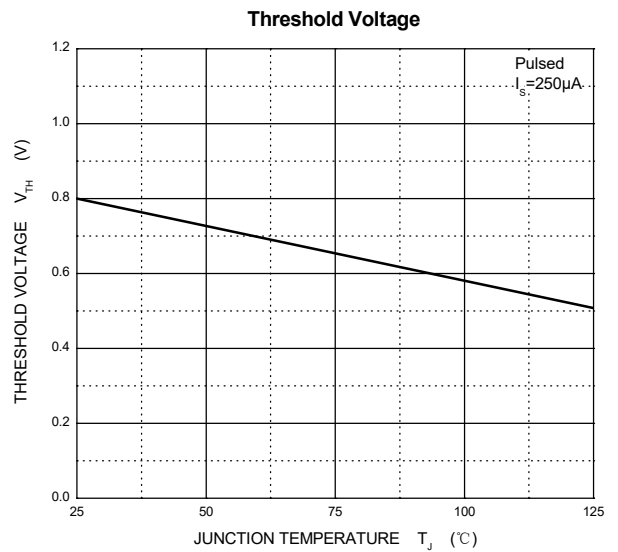
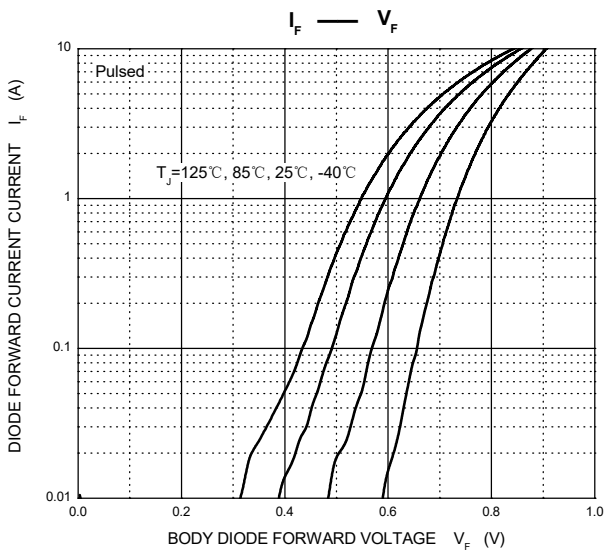
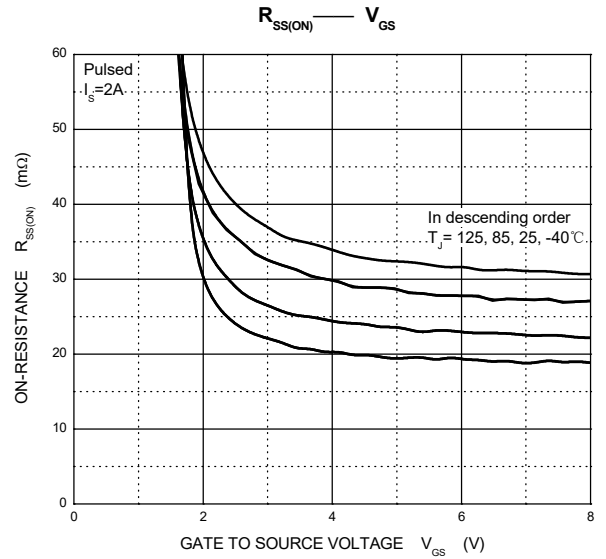
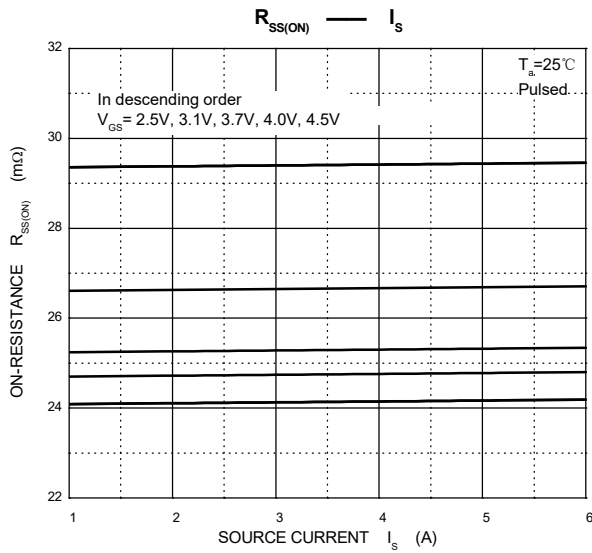
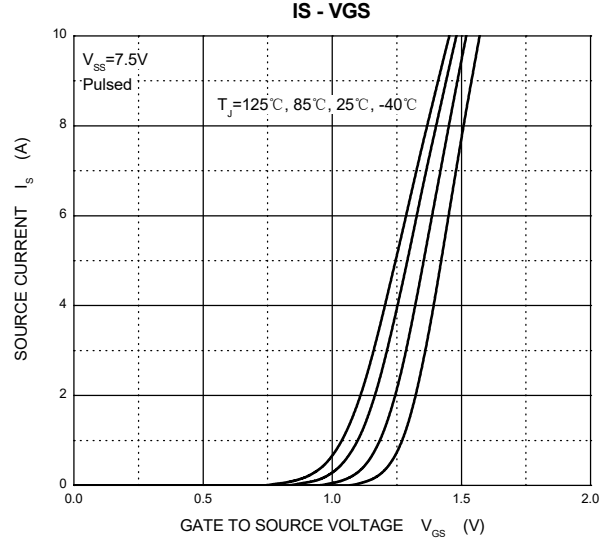
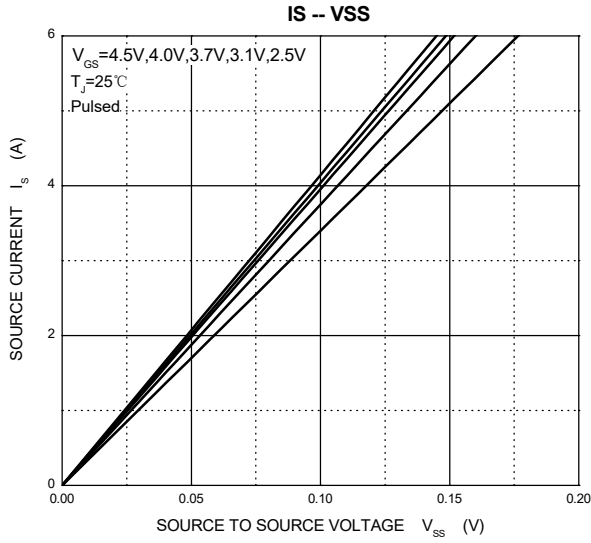
Notes: 1. Mounted on FR4 board (25.4mm×25.4mm×1.0mm) using the minimum recommended pad size (36um Copper).

2.  $t = 10\text{ ms}$ , Duty Cycle = 1%.

3. When FET1 is measured, G2 and S2 are short-circuited.

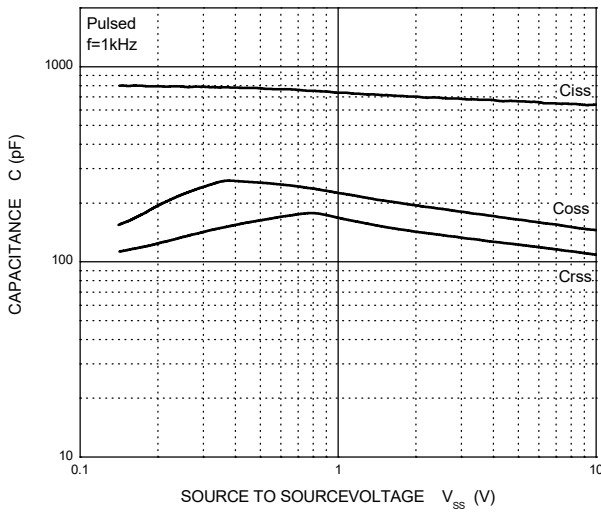


# Typical Characteristics

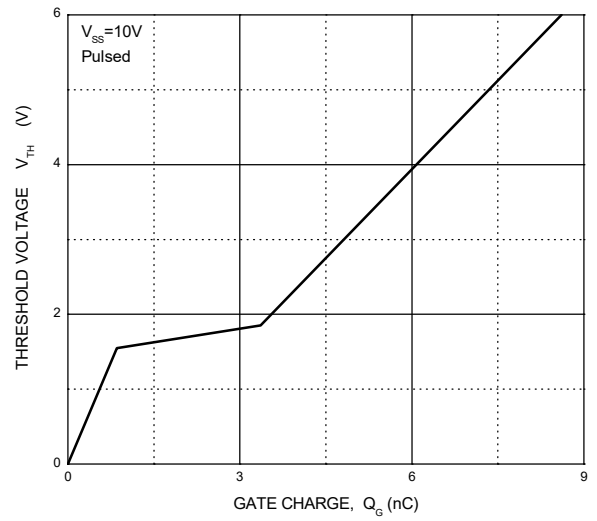


# Typical Characteristics

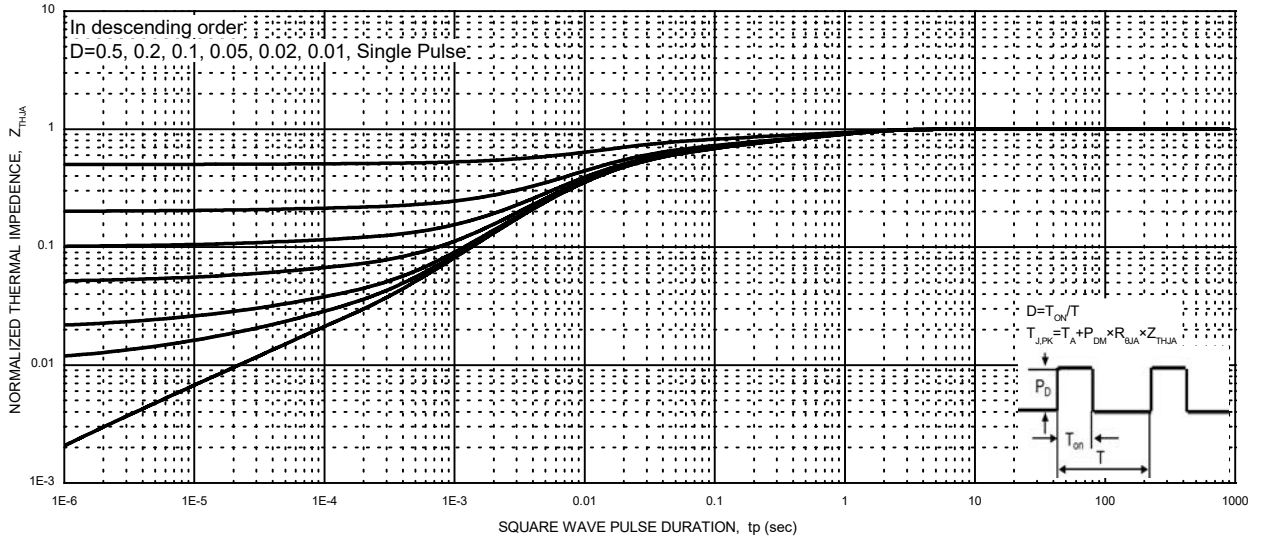
Capacitances



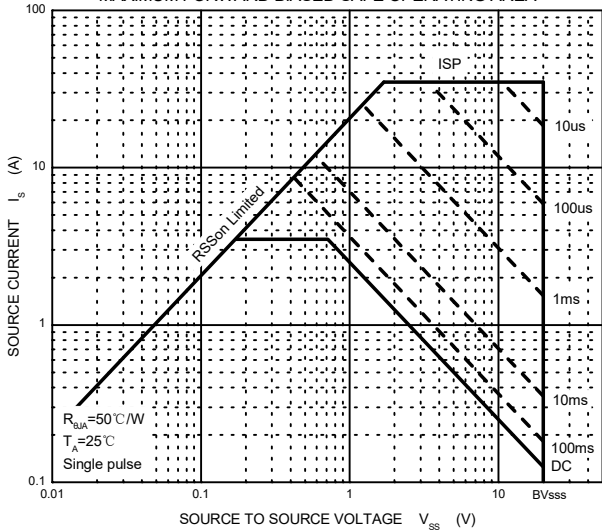
Gate Charge



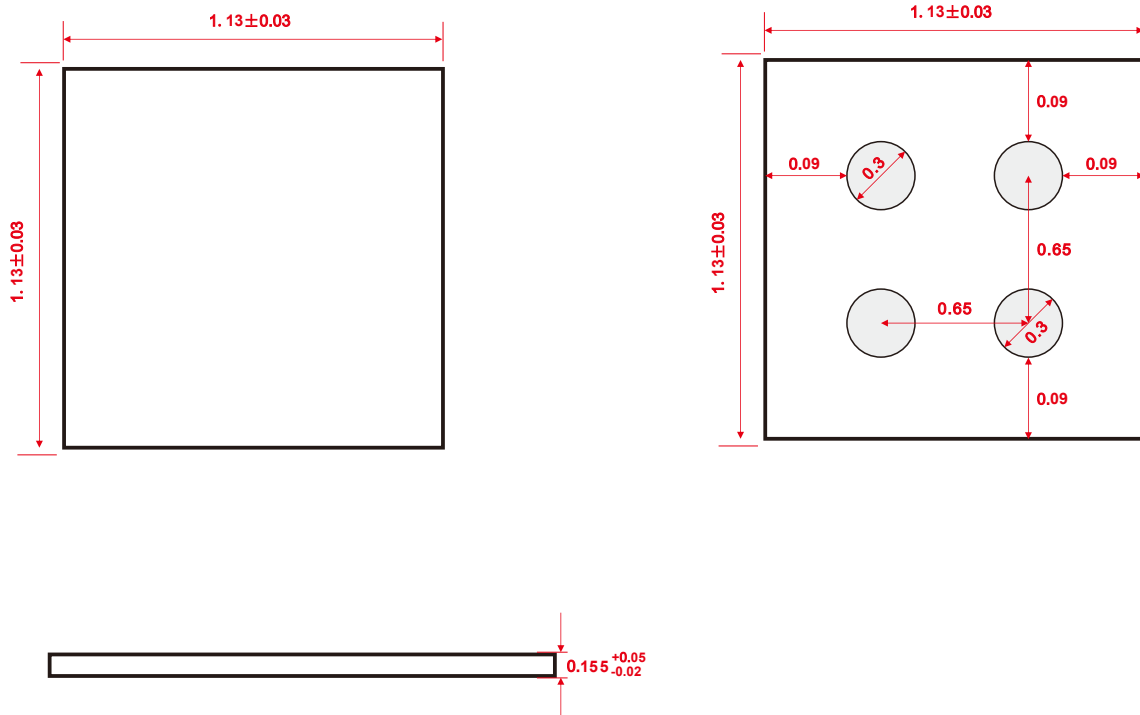
NORMALIZED TRANSIENT THERMAL IMPEDANCE



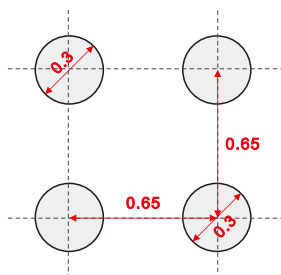
MAXIMUM FORWARD BIASED SAFE OPERATING AREA



## CSPB1111-4 Package Outline Dimensions(Unit:mm)



## CSPB1111-4 Suggested Pad Layout (Unit:mm)



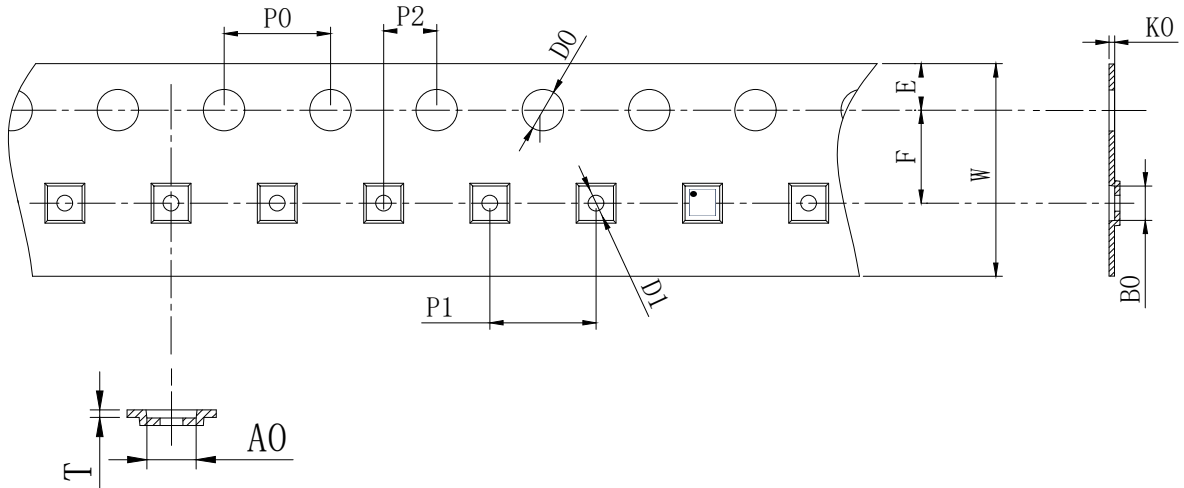
### Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.050$  mm.
3. The pad layout is for reference purposes only.

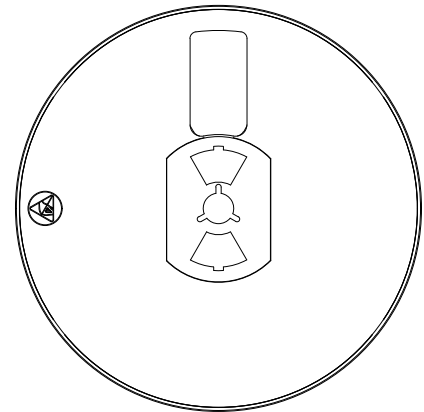
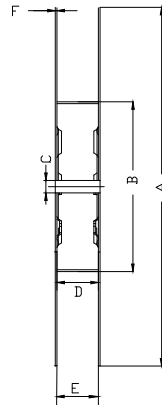
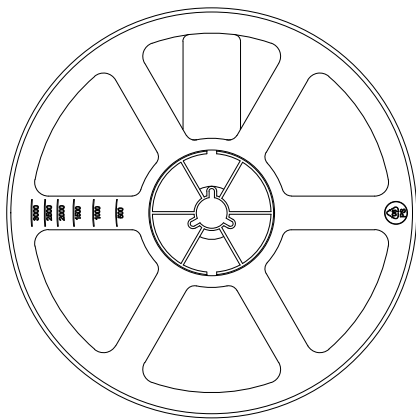
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# Tape and Reel



产品尺寸规格 (UNIT:mm)						
规格	A0	B0	K0	P0	P1	P2
尺寸	1.30±0.05	1.30±0.05	0.21±0.05	4.0±0.1	4.0±0.1	2.0±0.05
规格	T	E	F	D0	D1	W
尺寸	0.2±0.05	1.75±0.1	3.5±0.05	1.55±0.1	0.60±0.1	8.0 <sup>+0.3</sup> <sub>-0.1</sub>



SIZE	8MM
A	178±2.0
B	55±1.0
C	13.0 <sup>+0.35</sup> <sub>-0.15</sub>
D	8.4 <sup>+2.5</sup> <sub>-0.4</sub>
E	8.65 <sup>+4.7</sup> <sub>-0.65</sub>
F	1.5±0.5

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