



EFC4619R

Power MOSFET

24V, 6A, 23mΩ N-Channel Dual EFCP

ON Semiconductor®

<http://onsemi.com>

Features

- 2.5V drive
- Common-drain type
- 2KV ESD HBM
- Protection diode in
- Halogen free compliance

Applications

- Lithium-ion battery charging and discharging switch

Specifications

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

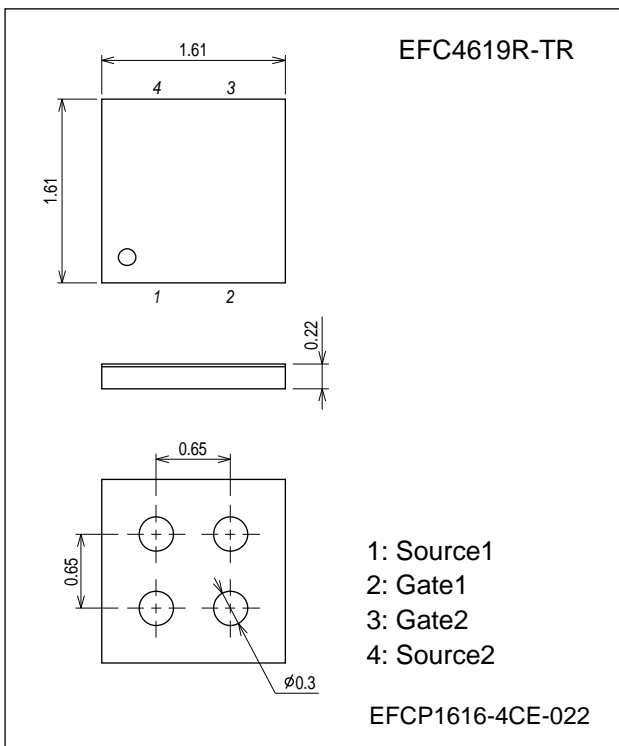
| Parameter | Symbol | Conditions | Ratings | Unit |
|--------------------------|-----------|--|-------------|------|
| Source to Source Voltage | V_{SSS} | | 24 | V |
| Gate to Source Voltage | V_{GSS} | | ± 12 | V |
| Source Current (DC) | I_S | | 6 | A |
| Source Current (Pulse) | I_{SP} | $PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$ | 60 | A |
| Total Dissipation | P_T | When mounted on ceramic substrate (5000mm ² ×0.8mm) | 1.6 | W |
| Channel Temperature | T_{ch} | | 150 | °C |
| Storage Temperature | T_{stg} | | -55 to +150 | °C |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Package Dimensions

unit : mm (typ)

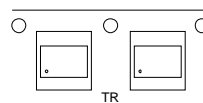
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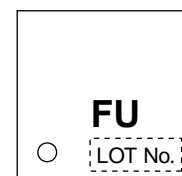
Ordering & Package Information

| Device | Package | Shipping | note |
|-------------|---------|------------------|--------------------------|
| EFC4619R-TR | EFCP | 5000 pcs. / reel | Pb-Free and Halogen-Free |

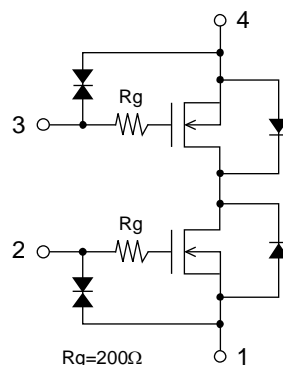
Packing Type: TR



Marking



Electrical Connection



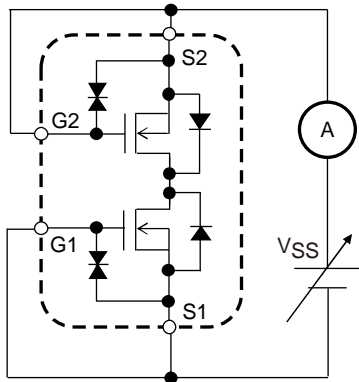
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Electrical Characteristics at Ta = 25°C

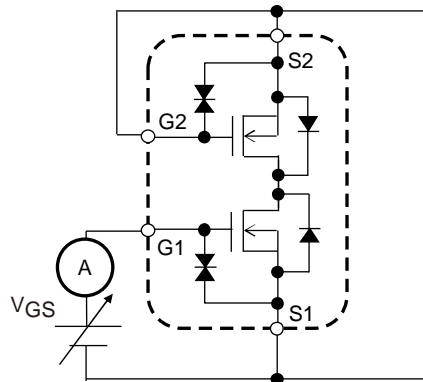
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|----------------------|--|--|-------|------|------|
| | | | min | typ | max | |
| Source to Source Breakdown Voltage | V(BR) _{SSS} | I _S =1mA, V _{GS} =0V Test Circuit 1 | 24 | | | V |
| Zero-Gate Voltage Source Current | I _{SSS} | V _{SS} =20V, V _{GS} =0V Test Circuit 1 | | | 1 | μA |
| Gate to Source Leakage Current | I _{GSS} | V _{GS} =±8V, V _{SS} =0V Test Circuit 2 | | | ±1 | μA |
| Cutoff Voltage | V _{GS(off)} | V _{SS} =10V, I _S =1mA Test Circuit 3 | 0.5 | | 1.3 | V |
| Forward Transfer Admittance | y _{fs} | V _{SS} =10V, I _S =3A Test Circuit 4 | | 5.8 | | S |
| Static Source to Source On-State Resistance | R _{SS(on)1} | I _S =3A, V _{GS} =4.5V Test Circuit 5 | 13.5 | 19.8 | 23 | mΩ |
| | R _{SS(on)2} | I _S =3A, V _{GS} =4.0V Test Circuit 5 | 14 | 20.5 | 24 | mΩ |
| | R _{SS(on)3} | I _S =3A, V _{GS} =3.7V Test Circuit 5 | 14.5 | 21 | 25.5 | mΩ |
| | R _{SS(on)4} | I _S =3A, V _{GS} =3.1V Test Circuit 5 | 14.9 | 23 | 30 | mΩ |
| | R _{SS(on)5} | I _S =3A, V _{GS} =2.5V Test Circuit 5 | 18.5 | 27 | 35 | mΩ |
| Turn-ON Delay Time | t _{d(on)} | V _{SS} =10V, V _{GS} =4.5V, I _S =3A Test Circuit 7 | | 340 | | ns |
| Rise Time | t _r | | | 440 | | ns |
| Turn-OFF Delay Time | t _{d(off)} | | | 24400 | | ns |
| Fall Time | t _f | | | 22400 | | ns |
| Total Gate Charge | Q _g | | V _{SS} =10V, V _{GS} =4.5V, I _S =6A Test Circuit 8 | | 21.7 | |
| Forward Source to Source Voltage | V _{F(S-S)} | I _S =3A, V _{GS} =0V Test Circuit 6 | | 0.8 | 1.2 | V |

Test circuits are example of measuring FET1 side

Test Circuit 1
I_{SSS}

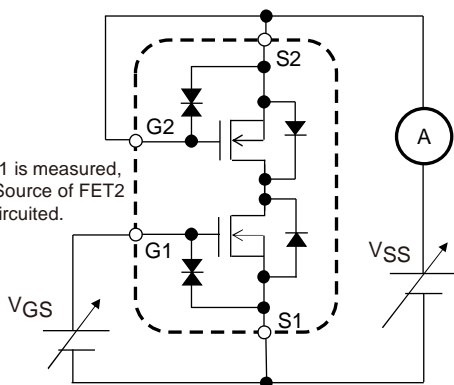


Test Circuit 2
I_{GSS}



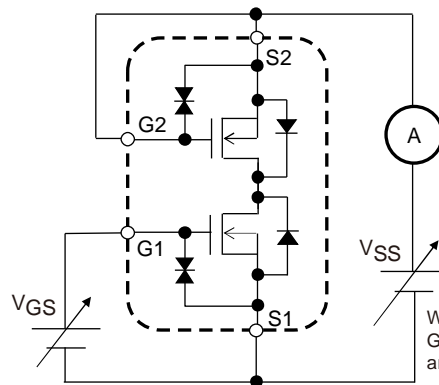
When FET1 is measured, Gate and Source of FET2 are short-circuited.

Test Circuit 3
V_{GS(off)}



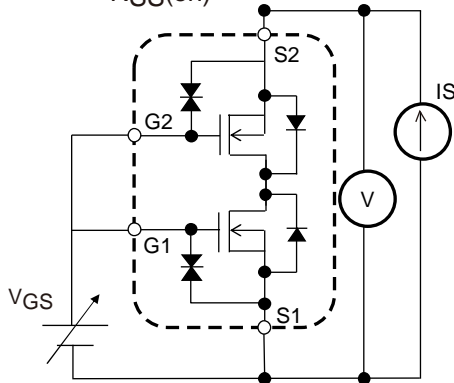
When FET1 is measured, Gate and Source of FET2 are short-circuited.

Test Circuit 4
|y_{fs}|

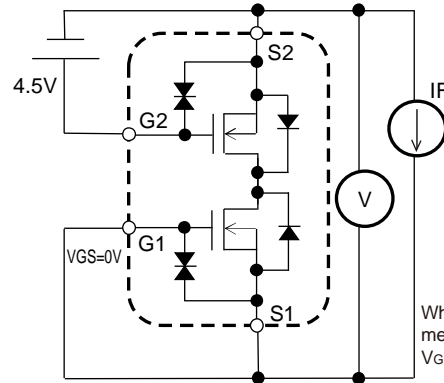


When FET1 is measured, Gate and Source of FET2 are short-circuited.

Test Circuit 5
R_{SS(on)}

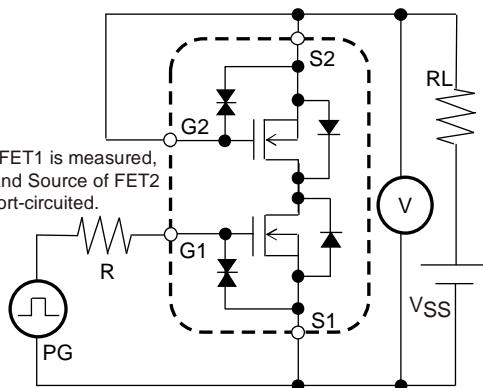


Test Circuit 6
V_{F(S-S)}



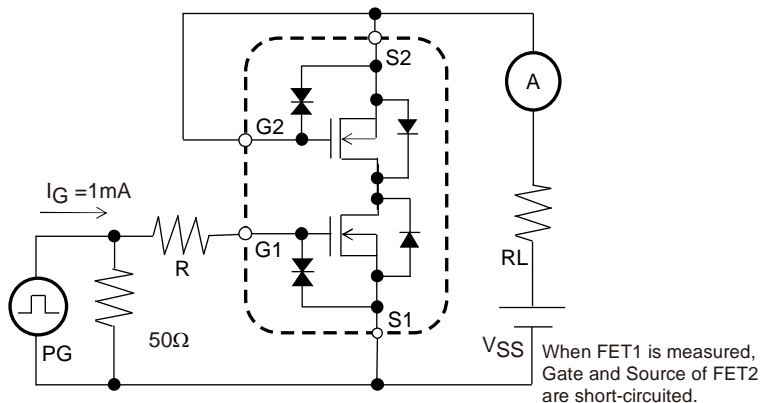
When FET1 is measured, +4.5V is added to V_{GS} of FET2.

Test Circuit 7
t_{d(on)}, t_r, t_{d(off)}, t_f



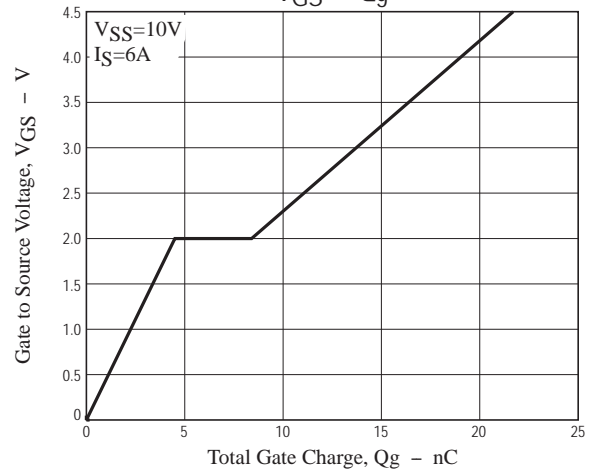
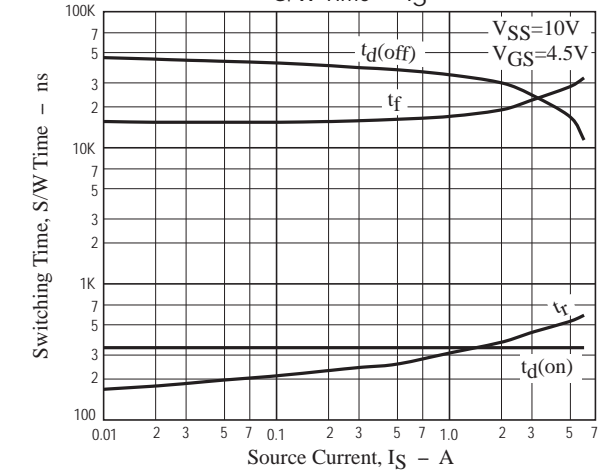
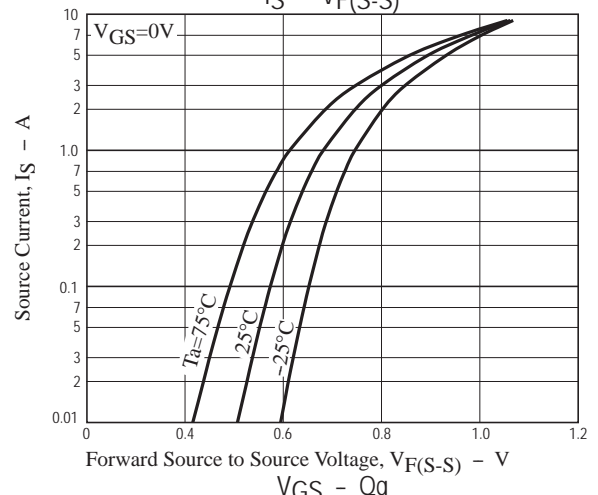
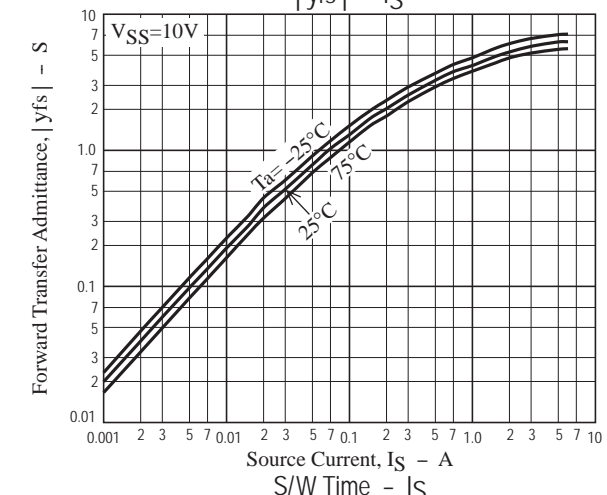
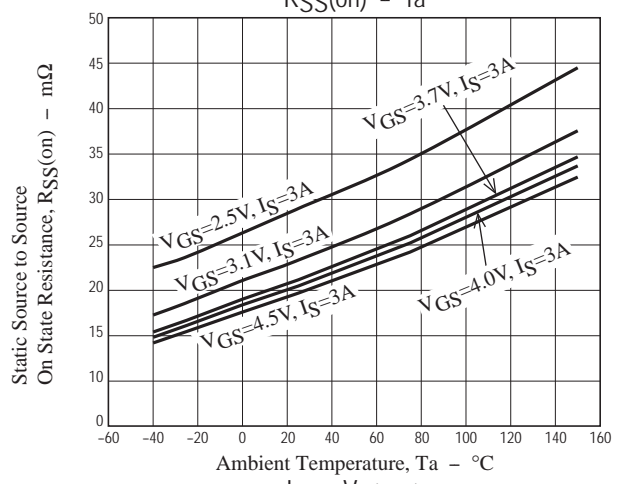
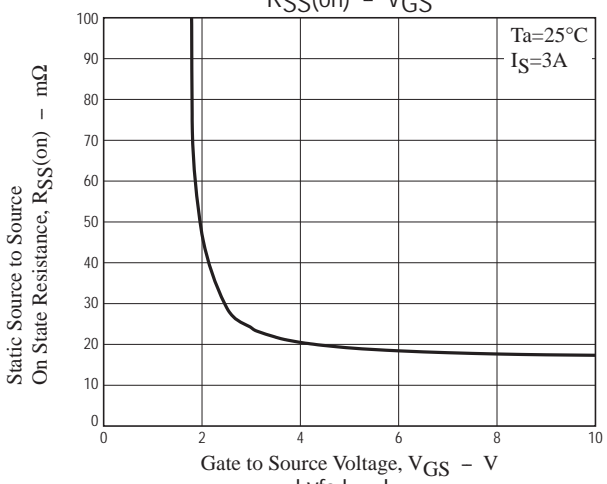
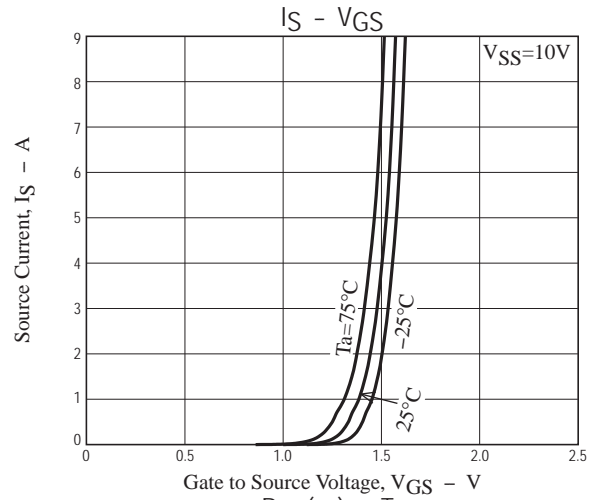
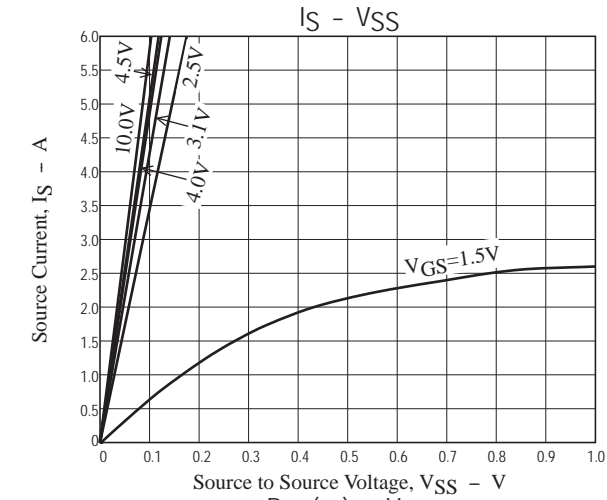
When FET1 is measured, Gate and Source of FET2 are short-circuited.

Test Circuit 8
Q_g

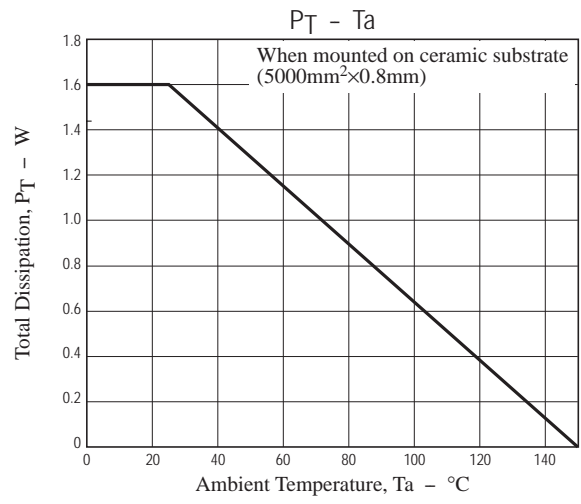
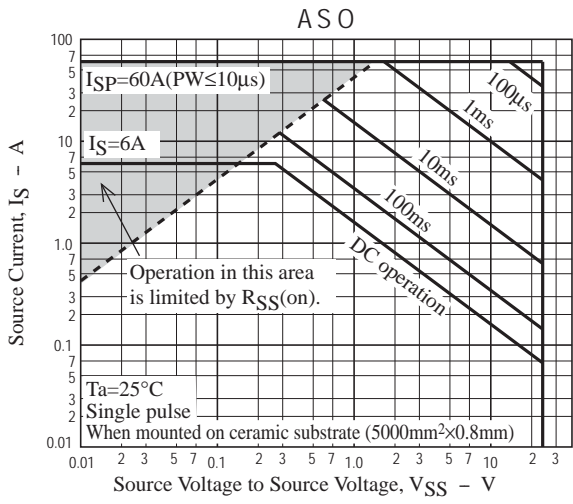


When FET1 is measured, Gate and Source of FET2 are short-circuited.

EFC4619R



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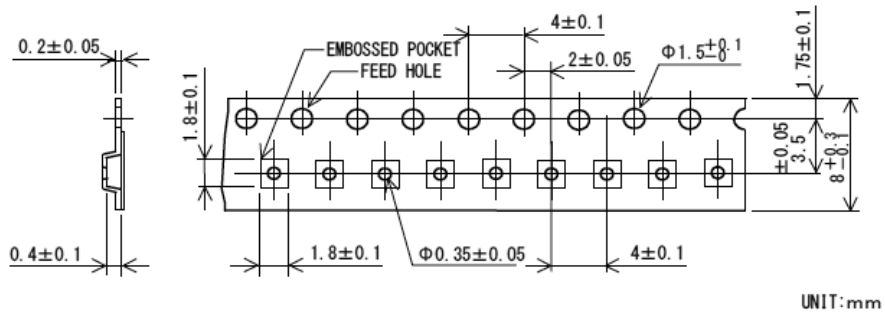
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Taping Specification

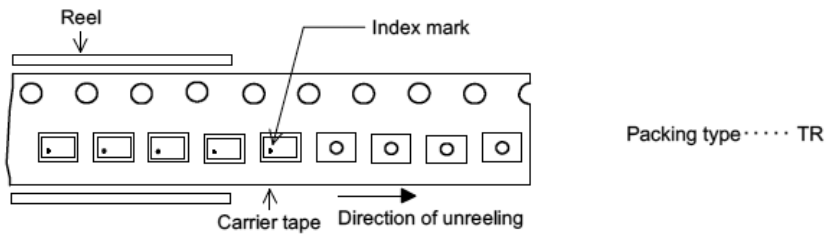
EFC4619R-TR

1. Taping Configuration

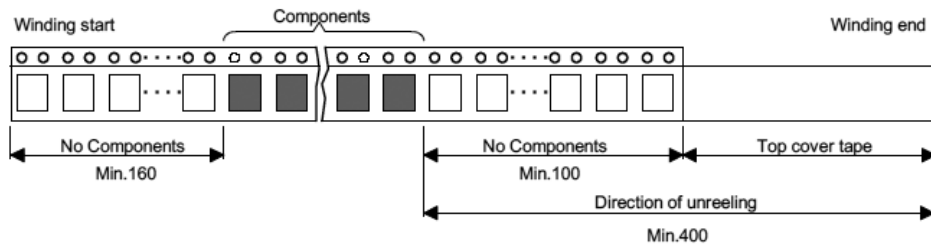
1-1. Carrier Tape Size (unit:mm)



1-2. Device Placement Direction



1-3. Leader portion and Trailer portion (unit:mm)

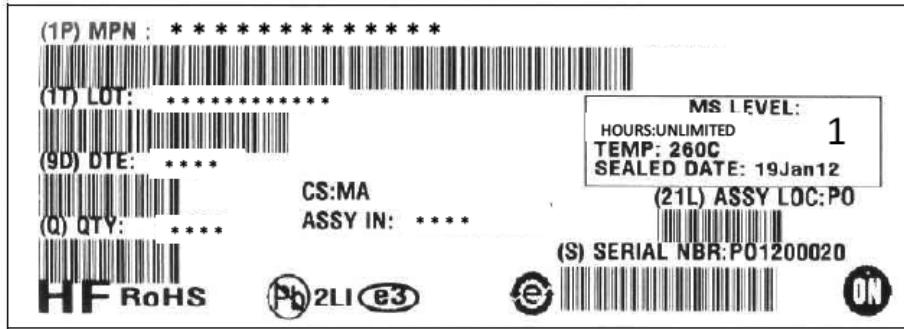


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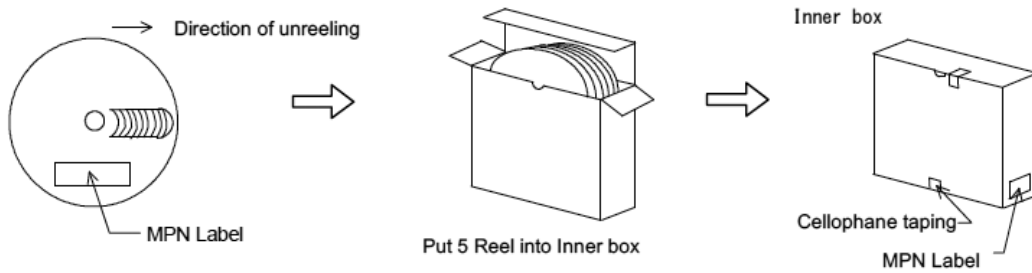
Packing Format

| Carrier Tape code | Package code | Maximum Number of devices contained. (pcs.) | | | Packing Format | |
|-------------------|------------------|---|-----------|--|--|--|
| | | Reel | Inner box | | Inner box BOX(C-1) | |
| 1818X04 | EFCP1616-4CE-022 | 5,000 | 25,000 | | 5reels contained. Dimensions:mm 183×72×185 | |

MPN Label



Packing Method

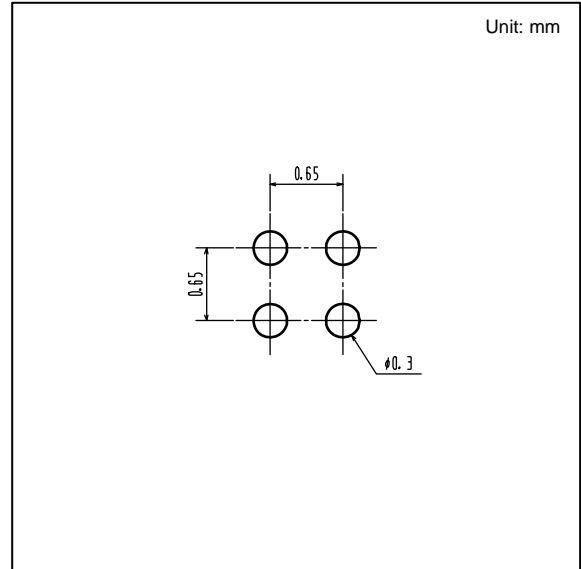
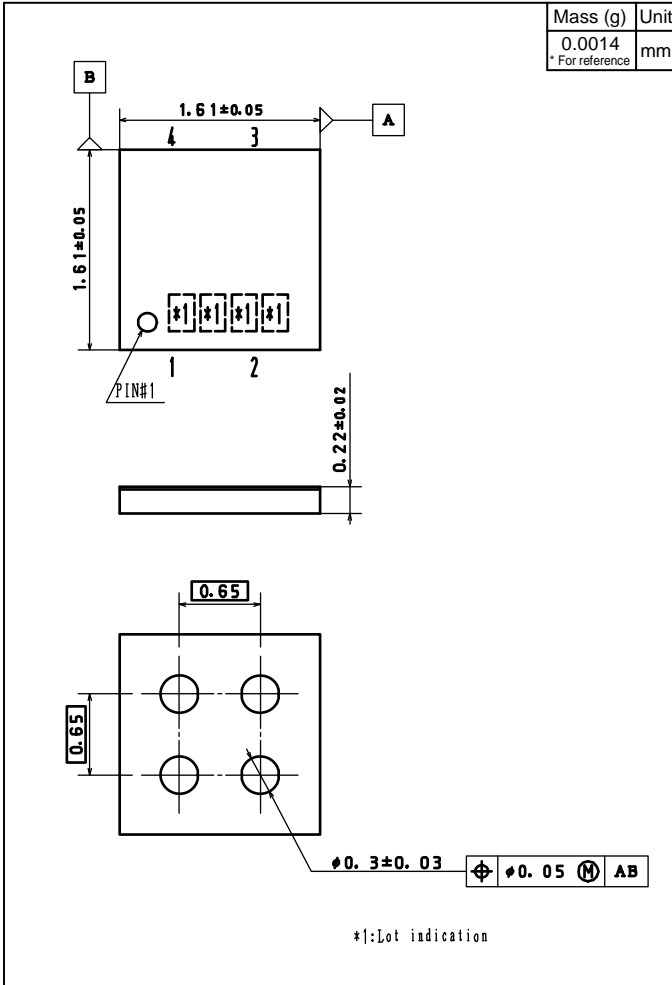


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Outline Drawing

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Land Pattern Example



Note on usage : Since the EFC4619R is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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