# EFC4618R-P

## Power MOSFET
## 24V, 6A, 23mΩ, Dual N-Channel

ON Semiconductor®

www.onsemi.com

### Features

- 2.5V Drive
- Best Suited for LiB Charging and Discharging Switch
- Common-drain Type
- ESD Diode - Protected Gate
- Pb-Free, Halogen Free and RoHS Compliance

### Specifications

**Absolute Maximum Ratings** at Ta=25°C

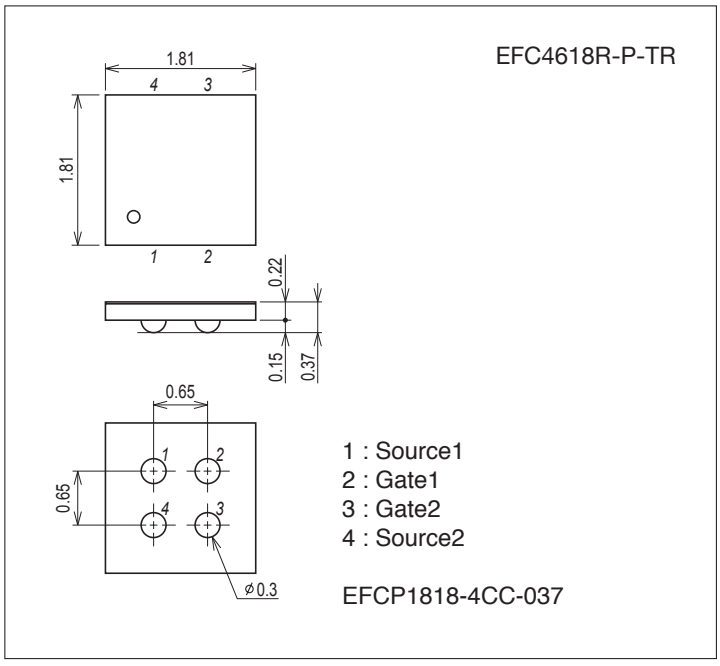
| Parameter | Symbol | Conditions | Ratings | Unit |
|---|---|---|---|---|
| Source-to-Source Voltage | $V_{SSS}$ | | 24 | V |
| Gate-to-Source Voltage | $V_{GSS}$ | | ±12 | V |
| Source Current (DC) | $I_S$ | | 6 | A |
| Source Current (Pulse) | $I_{SP}$ | PW≤10μs, duty cycle≤1% | 60 | A |
| Total Dissipation | $P_T$ | When mounted on ceramic substrate (5000mm²×0.8mm) | 1.6 | W |
| Channel Temperature | Tch | | 150 | °C |
| Storage Temperature | Tstg | | −55 to +150 | °C |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### Package Dimensions

unit : mm (typ)

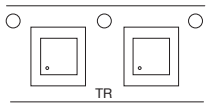
7069-001



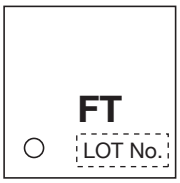

### Product & Package Information

- Package : EFCP
- JEITA, JEDEC : -
- Minimum Packing Quantity : 5,000 pcs./reel

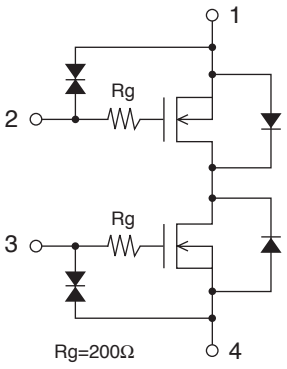
### Packing Type : TR




### Marking




### Electrical Connection




### ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

## Electrical Characteristics at Ta=25°C

| Parameter | Symbol | Conditions | | Ratings min | Ratings typ | Ratings max | Unit |
|---|---|---|---|---|---|---|---|
| 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 | | | ±10 | μA |
| Cutoff Voltage | $V_{GS}$(off) | $V_{SS}$=10V, $I_S$=1mA | Test Circuit 3 | 0.5 | | 1.3 | V |
| Forward Transfer Admittance | \| yfs \| | $V_{SS}$=10V, $I_S$=3A | Test Circuit 4 | | 6.5 | | 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) | See specified Test Circuit. | Test Circuit 7 | | 200 | | ns |
| Rise Time | $t_r$ | | | | 815 | | ns |
| Turn-OFF Delay Time | $t_d$(off) | | | | 1840 | | ns |
| Fall Time | $t_f$ | | | | 1770 | | ns |
| Total Gate Charge | Qg | $V_{SS}$=10V, $V_{GS}$=4.5V, $I_S$=6A | | | 25.4 | | nC |
| Forward Source-to-Source Voltage | $V_{F(S-S)}$ | $I_S$=3A, $V_{GS}$=0V | Test Circuit 6 | | 0.76 | 1.2 | V |

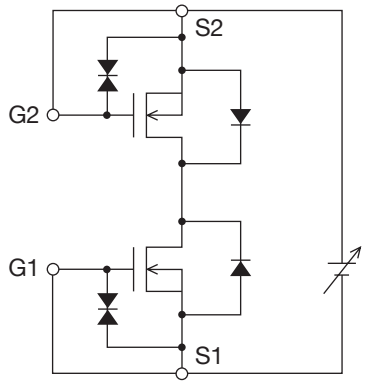
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

## ORDERING INFORMATION

| Device | Package | Shipping | memo |
|---|---|---|---|
| EFC4618R-P-TR | EFCP | 5,000pcs./reel | Pb-Free and Halogen Free |

**Test circuits are example of measuring FET1 side**

Test Circuit 1
$V_{SSS}$ / $I_{SSS}$

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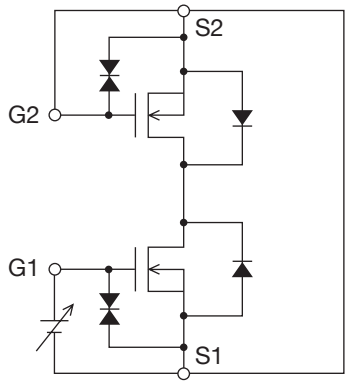
Test Circuit 2
$I_{GSS}$(+) / (–)

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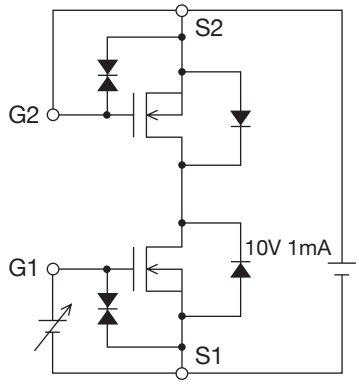
Test Circuit 3
$V_{GS}$(off)

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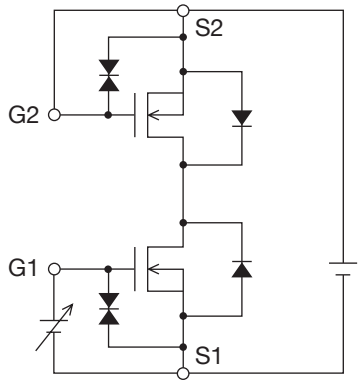
Test Circuit 4
| yfs |

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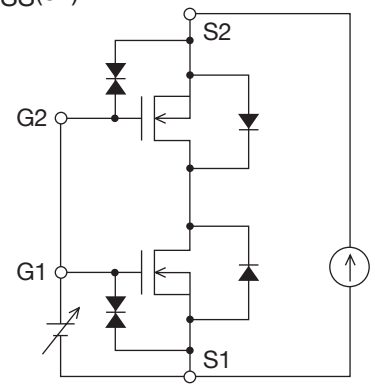
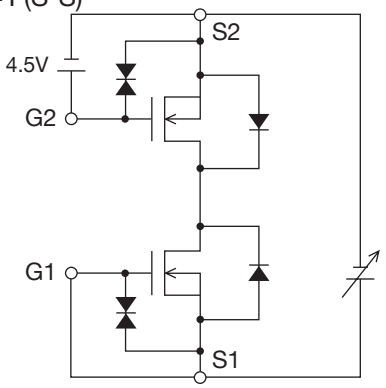
* Note: Connect the mesurement terminal reversely if you want to measure the FET2 side.

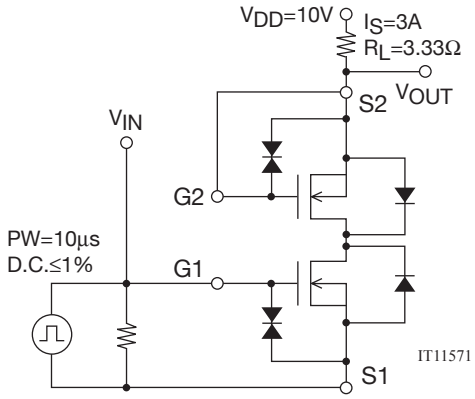
Test Circuit 5
$R_{SS}(on)$



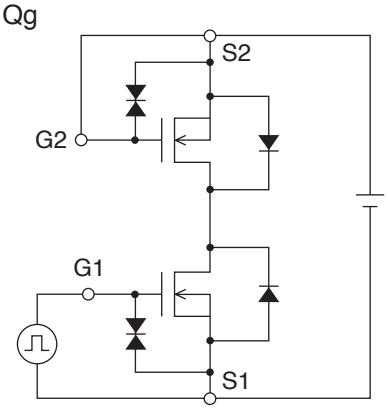

Test Circuit 6
$V_{F(S-S)}$



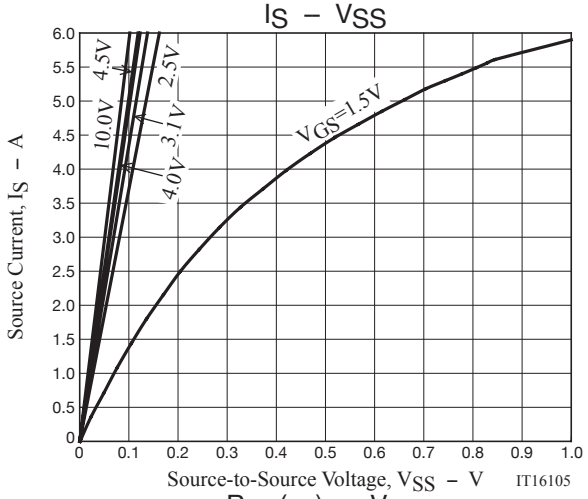

Test Circuit 7
$t_{d(on)}$, $t_r$, $t_{d(off)}$, $t_f$

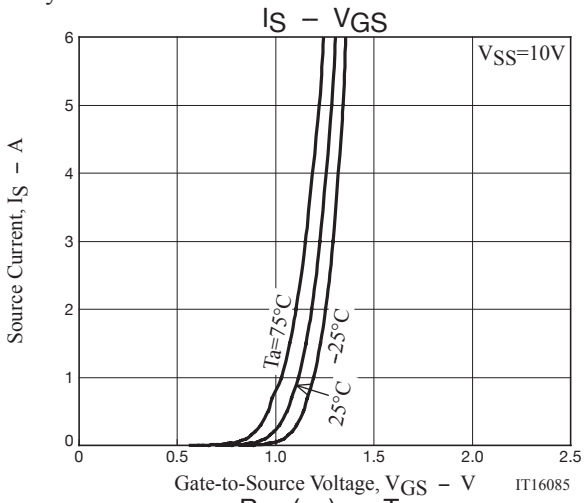


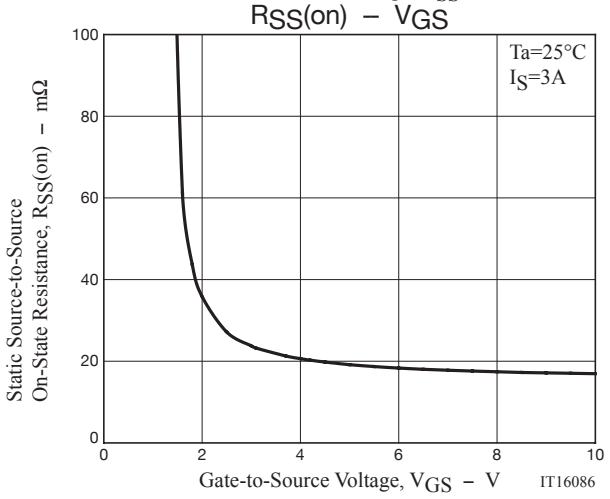

Test Circuit 8
Qg

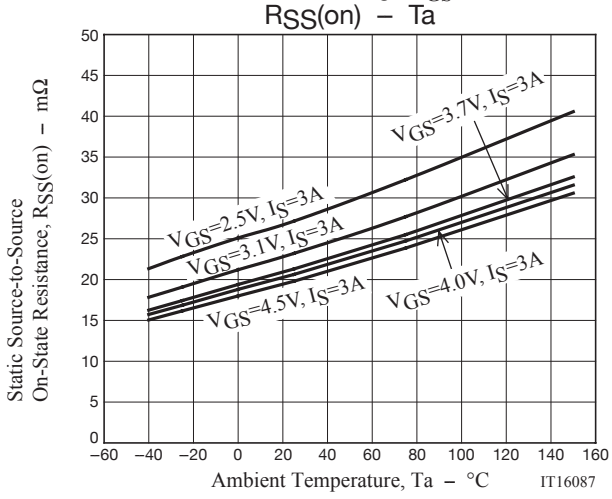



* Note: Connect the mesurement terminal reversely if you want to measure the FET2 side.

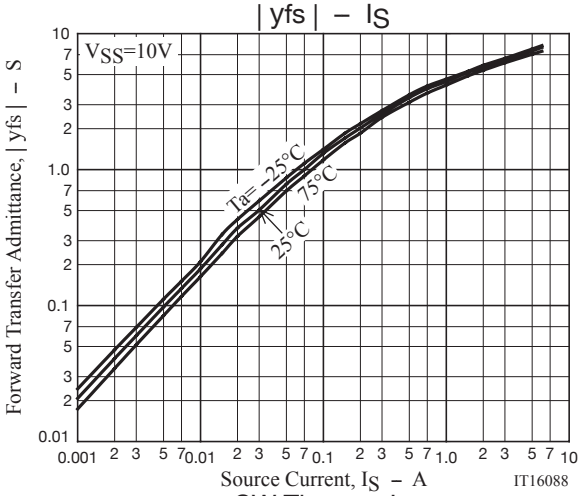


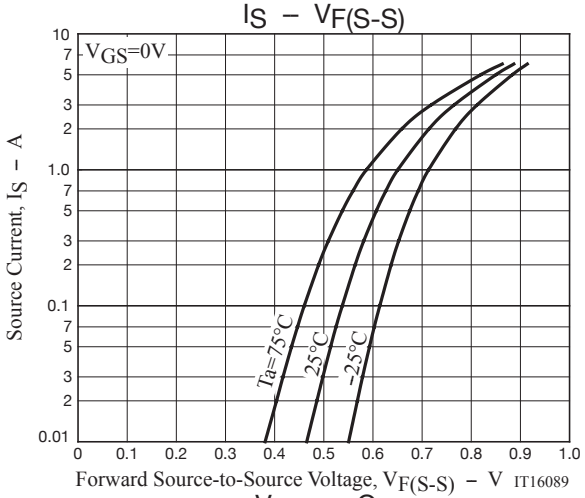



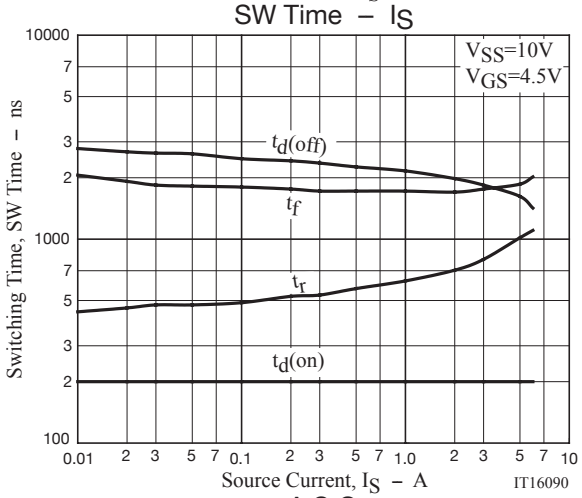
| yfs | – IS



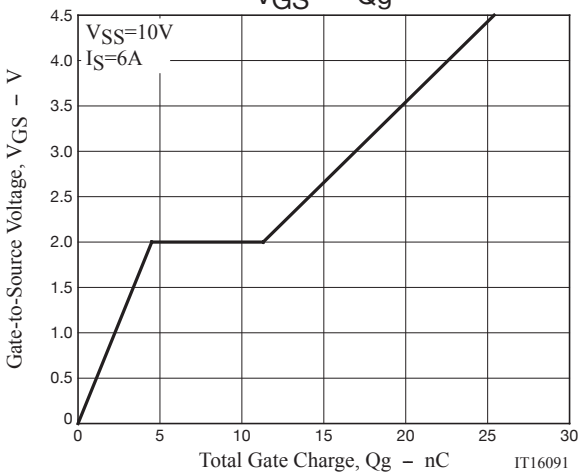

IS – VF(S-S)



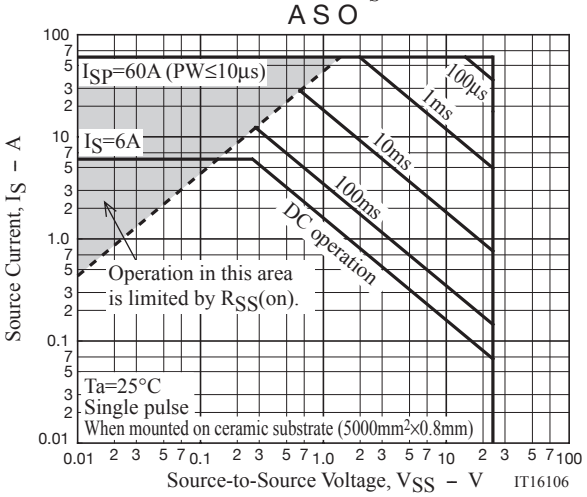

SW Time – IS



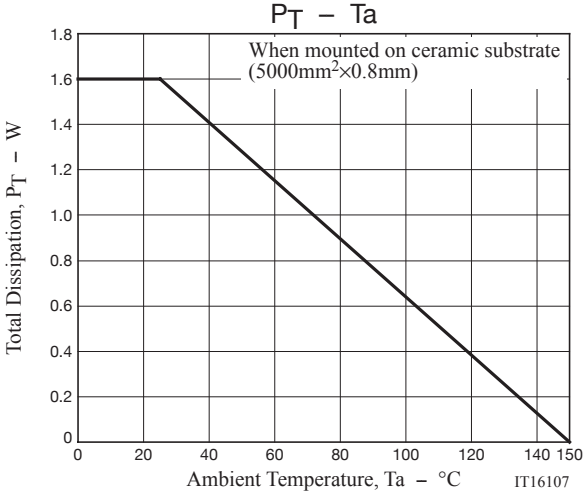

VGS – Qg




A S O

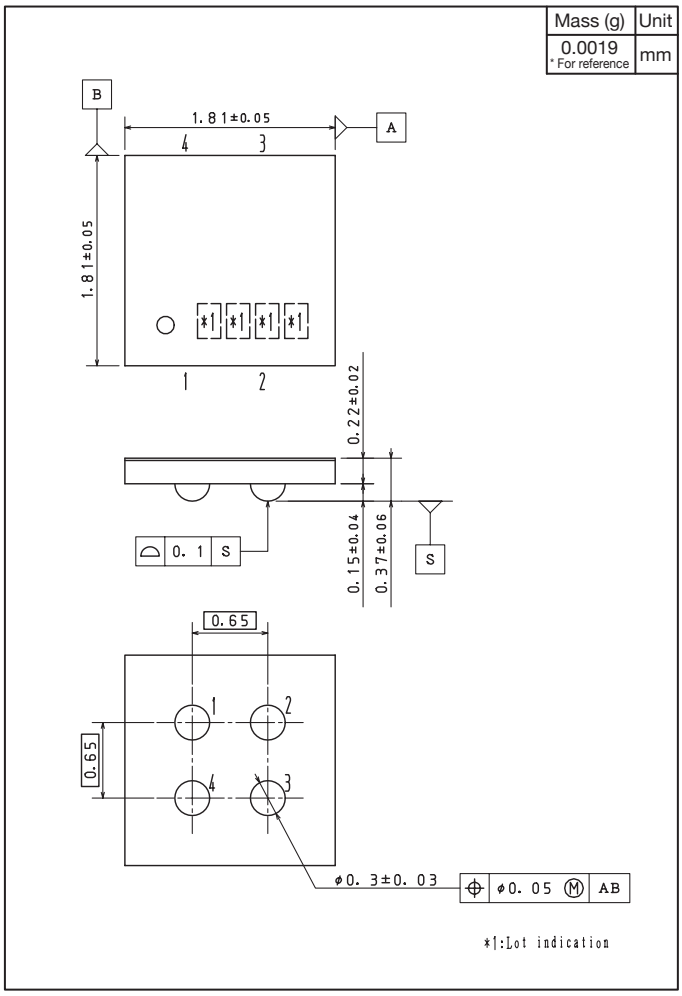



PT – Ta

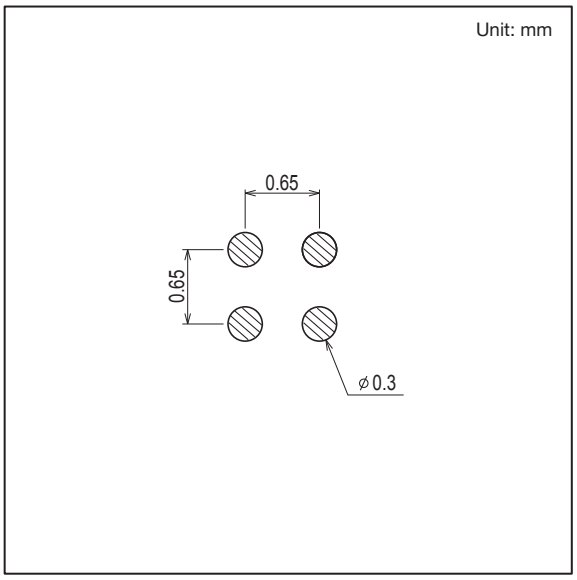


## Outline Drawing

EFC4618R-P-TR




## Land Pattern Example




Note on usage : Since the EFC4618R-P is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.