



SANYO Semiconductors

## DATA SHEET

An ON Semiconductor Company

N-Channel Silicon MOSFET

# EFC4615R — General-Purpose Switching Device Applications

## Features

- 2.5V drive
- Best suited for LiB charging and discharging switch
- Common-drain type
- Protection diode in
- Halogen free compliance

## Specifications

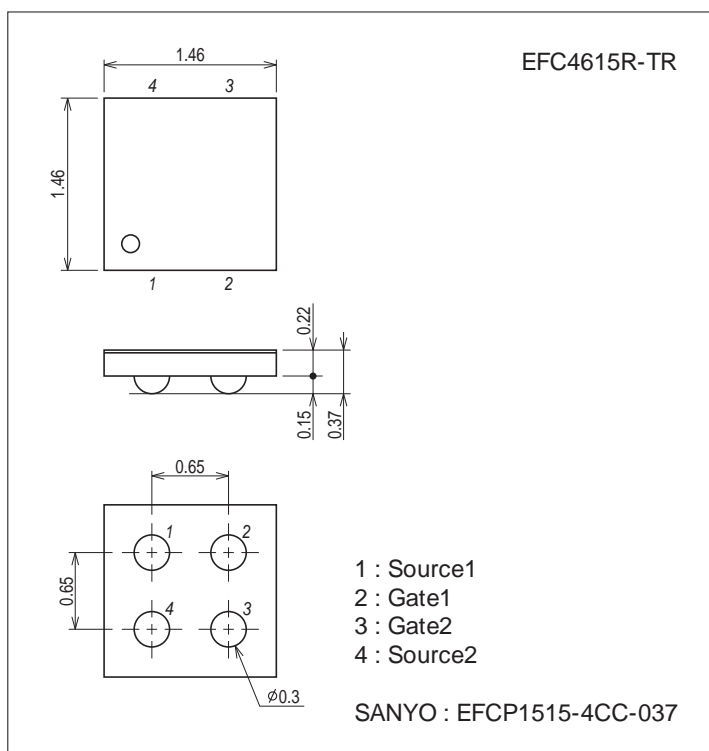
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Source-to-Source Voltage	V <sub>SS</sub>		24	V
Gate-to-Source Voltage	V <sub>GSS</sub>		±12	V
Source Current (DC)	I <sub>S</sub>		6	A
Source Current (Pulse)	I <sub>SP</sub>	PW≤10μs, duty cycle≤1%	60	A
Total Dissipation	P <sub>T</sub>	When mounted on ceramic substrate (5000mm <sup>2</sup> ×0.8mm)	1.6	W
Channel Temperature	T <sub>ch</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

## Package Dimensions

unit : mm (typ)

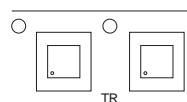
7067-001



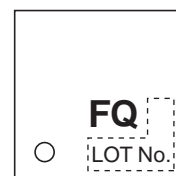
## Product & Package Information

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

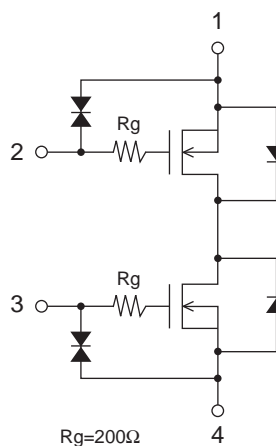
## Taping Type : TR



## Marking



## Electrical Connection



SANYO Semiconductor Co., Ltd.

<http://www.sanyosemi.com/en/network/>

# EFC4615R

## 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	$\mu A$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8V$ , $V_{SS}=0V$ Test Circuit 2			$\pm 10$	$\mu A$
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		5.4		S
Static Source-to-Source On-State Resistance	$R_{SS(on)1}$	$I_S=3A$ , $V_{GS}=4.5V$ Test Circuit 5	19	27	31	$m\Omega$
	$R_{SS(on)2}$	$I_S=3A$ , $V_{GS}=4.0V$ Test Circuit 5	21	28	33	$m\Omega$
	$R_{SS(on)3}$	$I_S=3A$ , $V_{GS}=3.1V$ Test Circuit 5	24	33	44	$m\Omega$
	$R_{SS(on)4}$	$I_S=3A$ , $V_{GS}=2.5V$ Test Circuit 5	28	39	52	$m\Omega$
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit. Test Circuit 7		13		ns
Rise Time	$t_r$			235		ns
Turn-OFF Delay Time	$t_{d(off)}$			335		ns
Fall Time	$t_f$			360		ns
Total Gate Charge	$Q_g$	$V_{SS}=10V$ , $V_{GS}=4.5V$ , $I_S=6A$		8.8		nC
Forward Source-to-Source Voltage	$V_{F(S-S)}$	$I_S=6A$ , $V_{GS}=0V$ Test Circuit 6		1	1.2	V

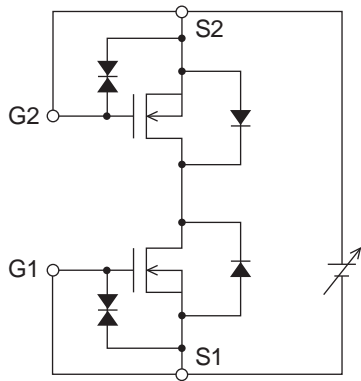
## Ordering Information

Device	Package	Shipping	memo
EFC4615R-TR	EFCP	5,000pcs./reel	Pb Free and Halogen Free

## Test circuits are example of measuring FET1 side

### Test Circuit 1

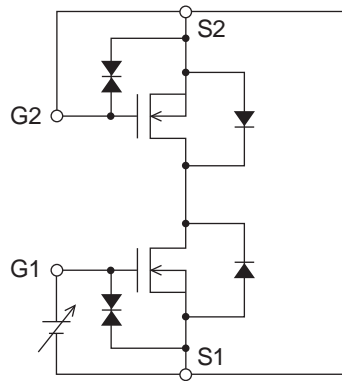
$V_{SSS}$  /  $I_{SSS}$



IT11565

### Test Circuit 2

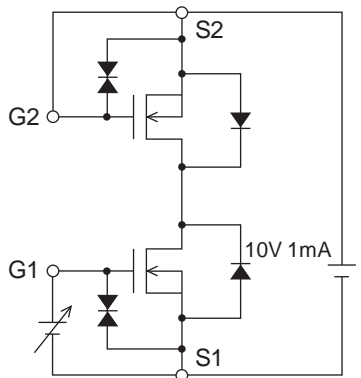
$I_{GSS(+)} / (-)$



IT11566

### Test Circuit 3

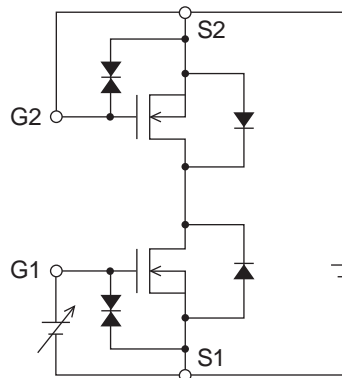
$V_{GS(off)}$



IT11567

### Test Circuit 4

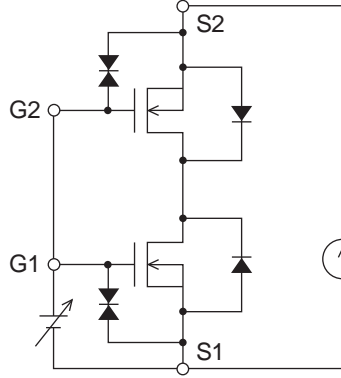
$|y_{fs}|$



IT11568

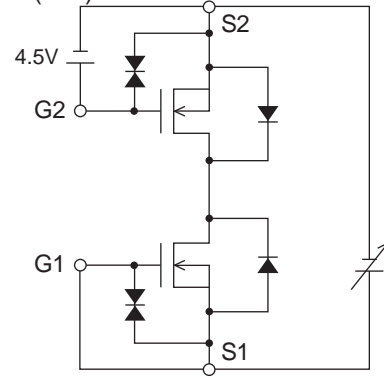
\* Note: Connect the measurement terminal reversely if you want to measure the FET2 side.

Test Circuit 5  
RSS(on)



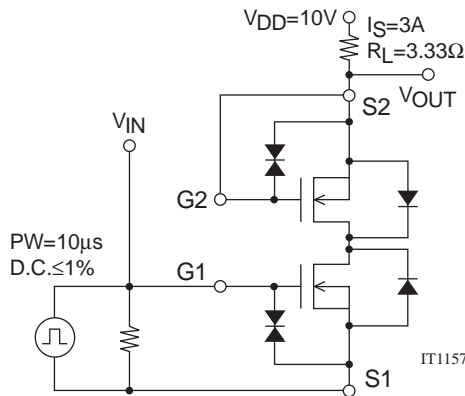
IT11569

Test Circuit 6  
VF(S-S)



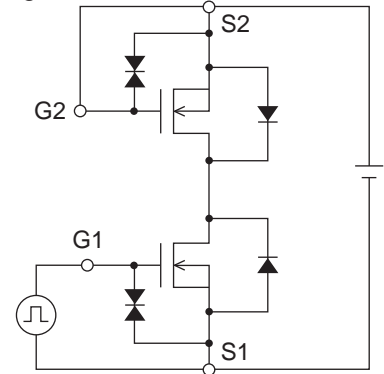
IT11570

Test Circuit 7  
td(on), tr, td(off), tf



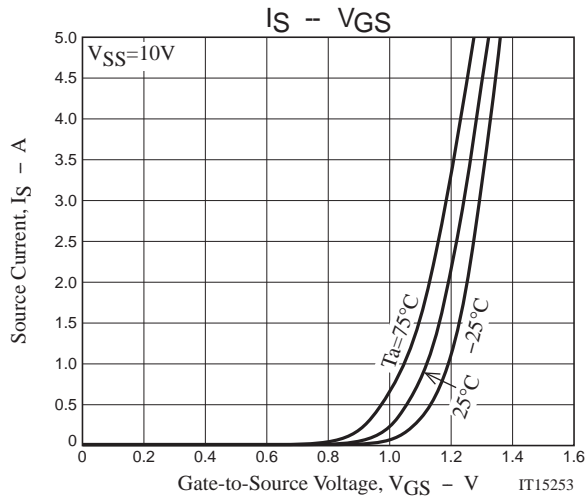
IT11571

Test Circuit 8  
Qg

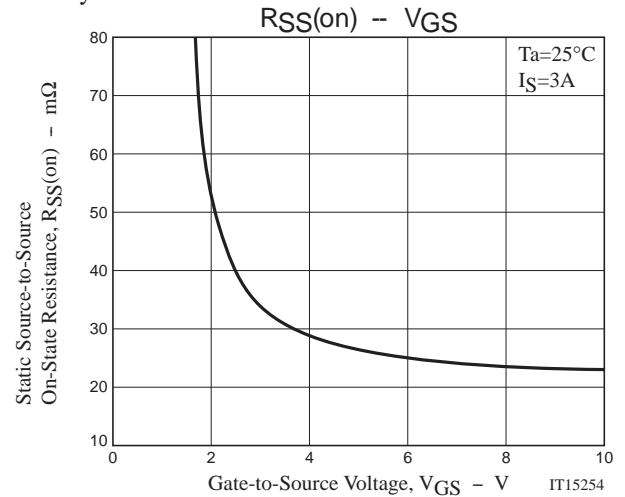


IT15409

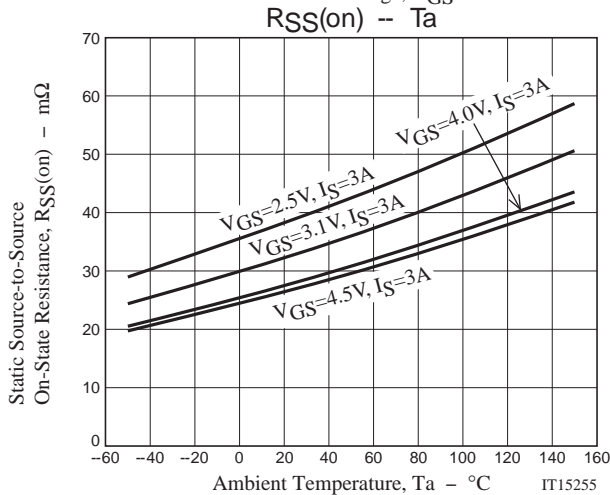
\* Note: Connect the measurement terminal reversely if you want to measure the FET2 side.



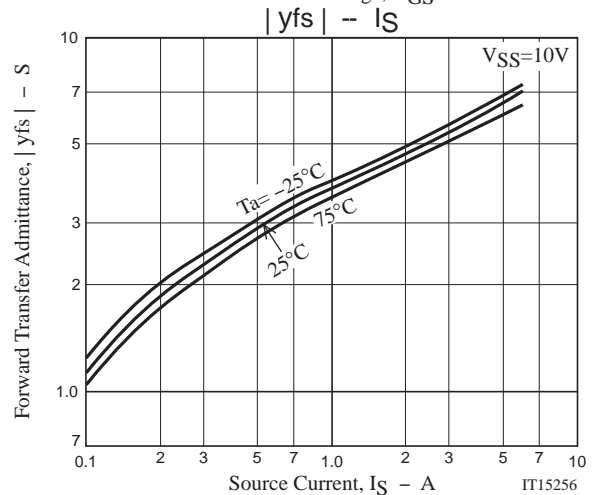
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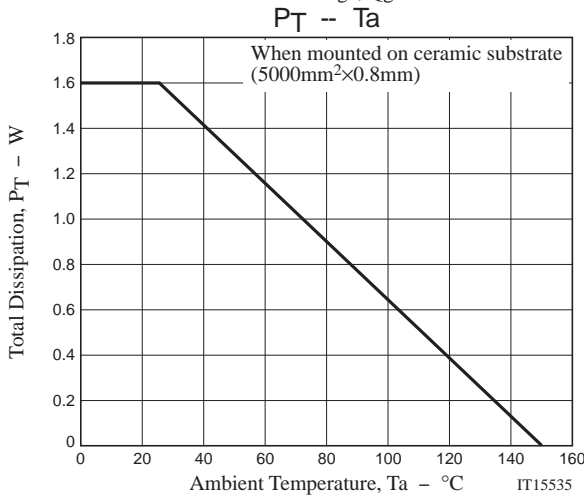
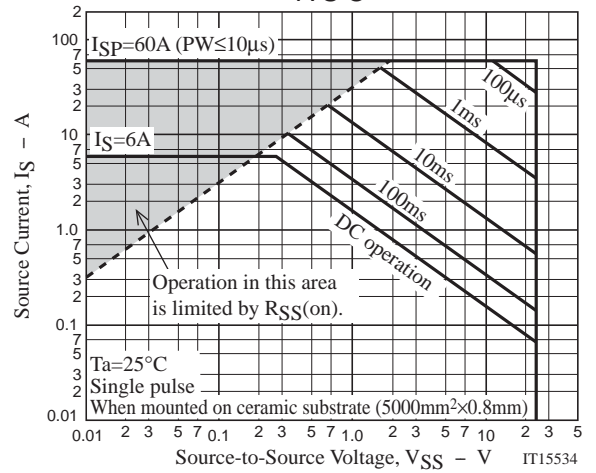
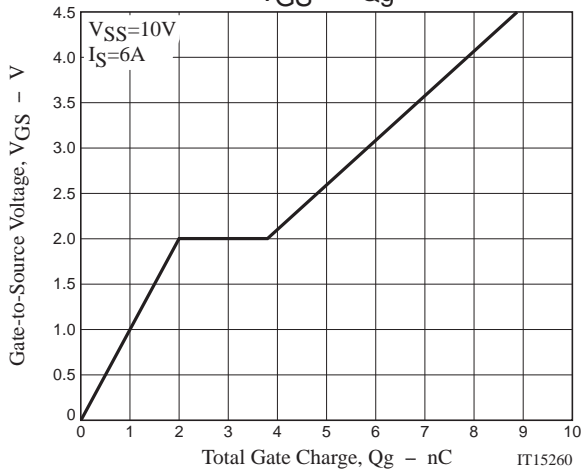
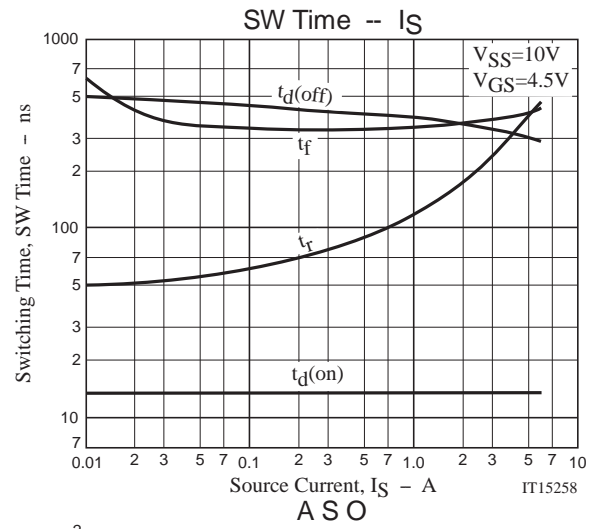
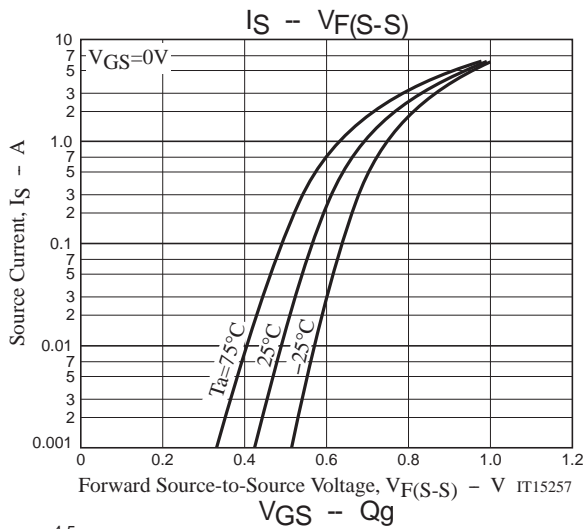
IT15254



IT15255



IT15256



**EFC4615R**

## Taping Specification

EFC4615R-TR

## 1. Packing Format

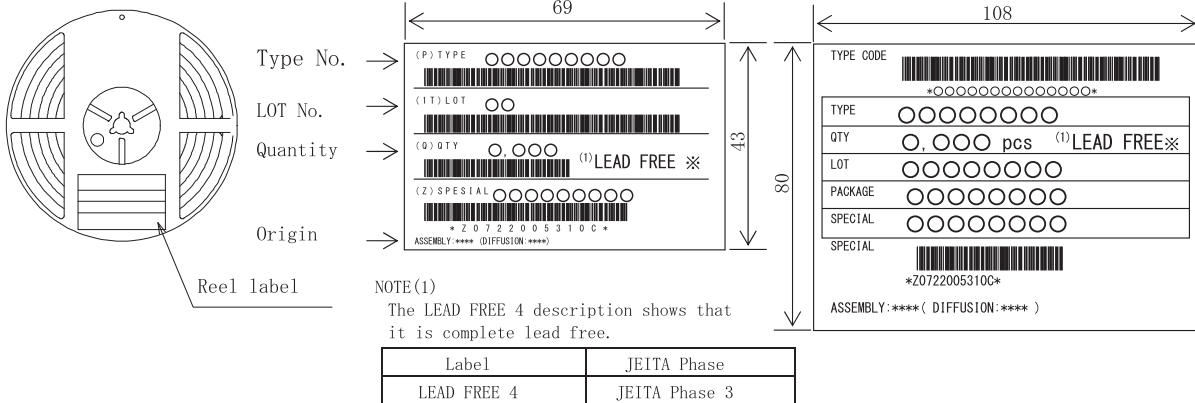
Package Name	Carrier Tape Type	Maximum Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	Inner BOX (C-1)	Outer BOX (A-7)
EFCP1515-4CC-037	CARR (165X055)	5, 000	25, 000	150, 000	5 reels contained Dimensions :mm (external) 183 X 72 X 185	6 inner boxes contained Dimensions :mm (external) 440 X 195 X 210

Packing method

Reel label, Inner box label  
(unit: mm)

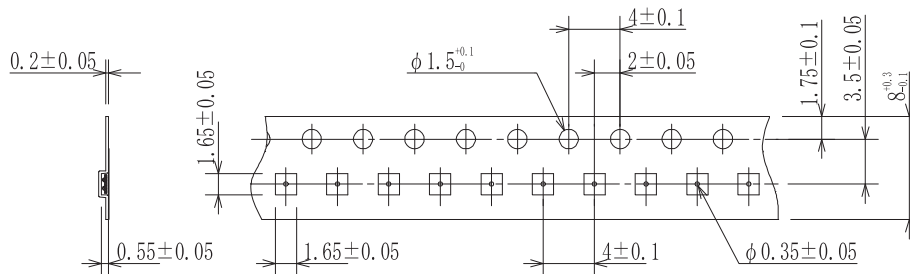
Outer box label

It is a label at the time of factory shipments.  
The form of a label may change in physical  
distribution process.

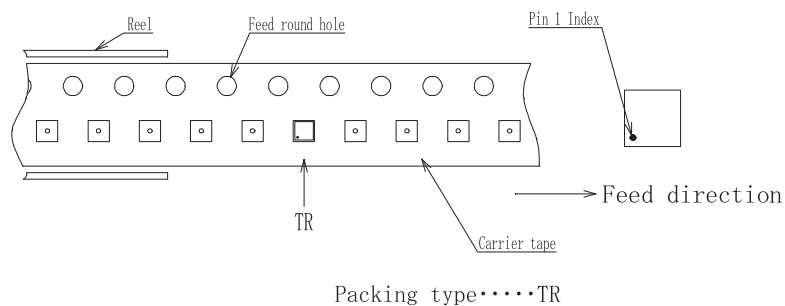


## 2. Taping configuration

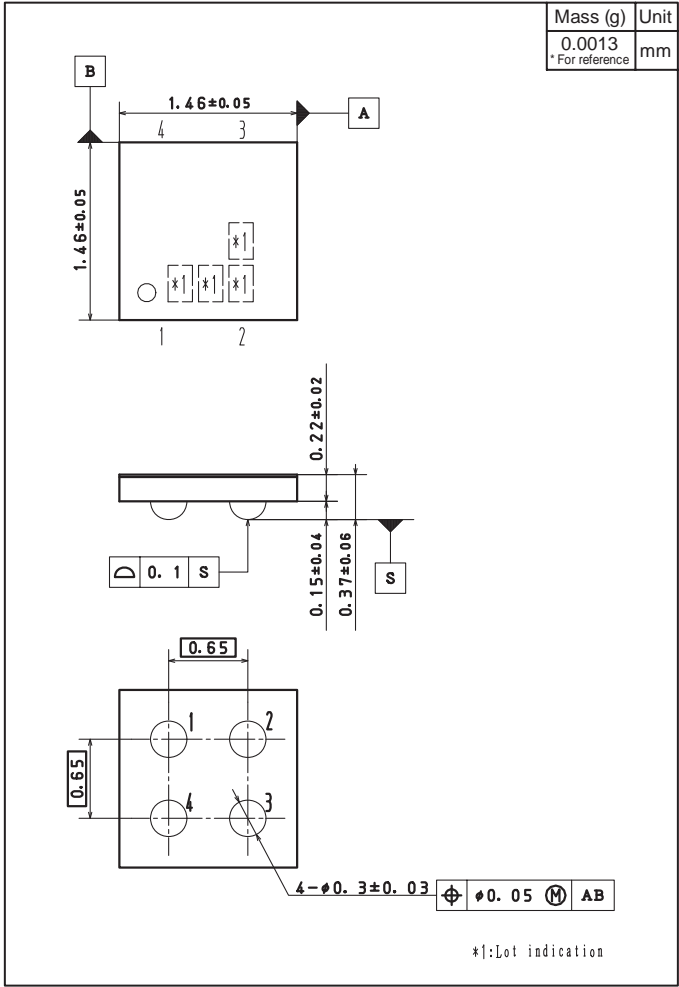
2-1. Carrier tape size (unit: mm)



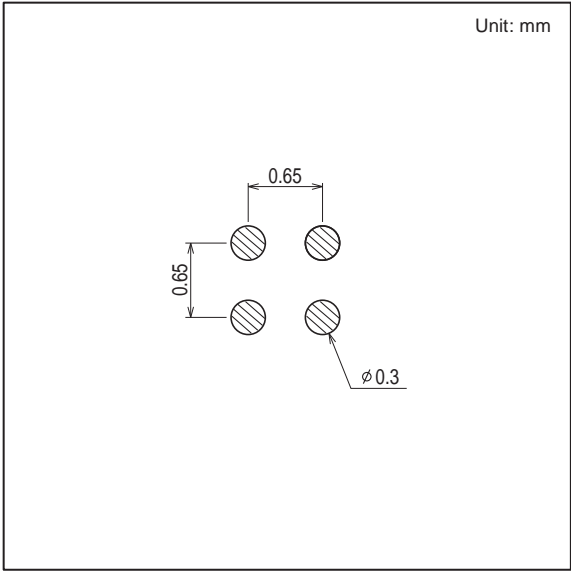
## 2-2. Device placement direction



Outline Drawing  
EFC4615R-TR



Land Pattern Example



Note on usage : Since the EFC4615R is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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