



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

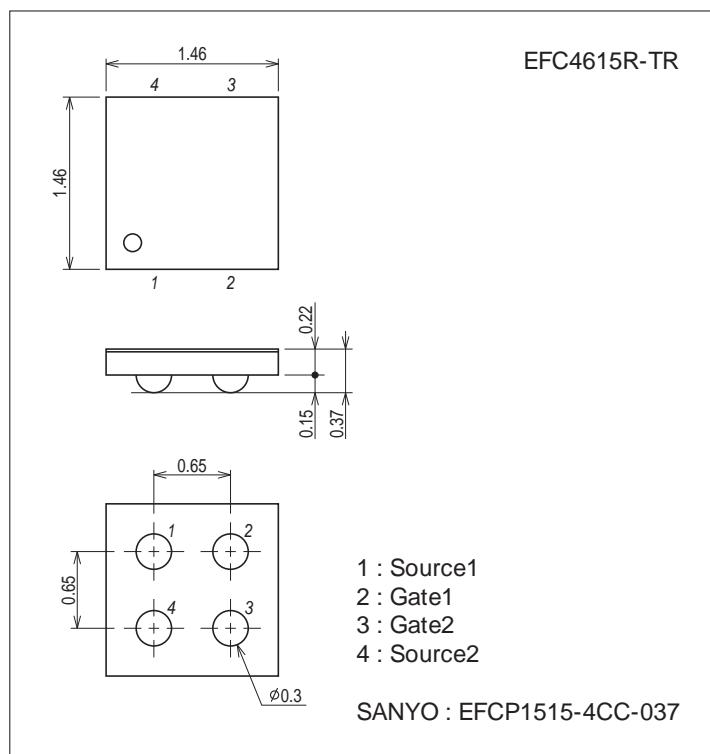
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Source-to-Source Voltage	V _{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 (5000mm ² ×0.8mm)	1.6	W
Channel Temperature	T _{ch}		150	°C
Storage Temperature	T _{stg}		-55 to +150	°C

Package Dimensions

unit : mm (typ)

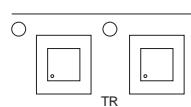
7067-001



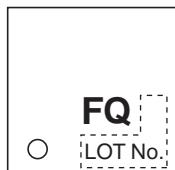
Product & Package Information

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

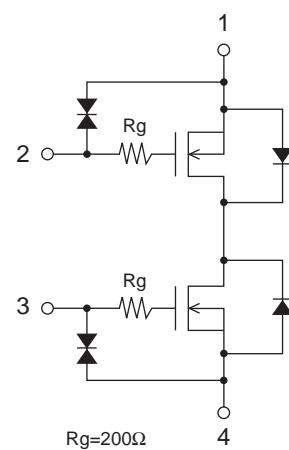
Taping Type : TR



Marking



Electrical Connection



SANYO Semiconductor Co., Ltd.

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

Electrical Characteristics at $T_a=25^\circ\text{C}$

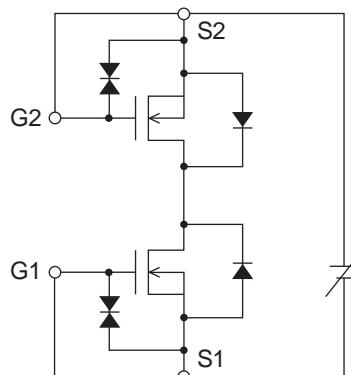
Parameter	Symbol	Conditions	Ratings			Unit	
			min	typ	max		
Source-to-Source Breakdown Voltage	$V(\text{BR})_{\text{SSS}}$	$I_S=1\text{mA}, V_{GS}=0\text{V}$	Test Circuit 1	24		V	
Zero-Gate Voltage Source Current	I_{SSS}	$V_{SS}=20\text{V}, V_{GS}=0\text{V}$	Test Circuit 1		1	μA	
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8\text{V}, V_{SS}=0\text{V}$	Test Circuit 2		± 10	μA	
Cutoff Voltage	$V_{GS(\text{off})}$	$V_{SS}=10\text{V}, I_S=1\text{mA}$	Test Circuit 3	0.5		V	
Forward Transfer Admittance	$ y_{\text{fs}} $	$V_{SS}=10\text{V}, I_S=3\text{A}$	Test Circuit 4		5.4	S	
Static Source-to-Source On-State Resistance	$R_{\text{SS(on)1}}$	$I_S=3\text{A}, V_{GS}=4.5\text{V}$	Test Circuit 5	19	27	$\text{m}\Omega$	
	$R_{\text{SS(on)2}}$	$I_S=3\text{A}, V_{GS}=4.0\text{V}$	Test Circuit 5	21	28	$\text{m}\Omega$	
	$R_{\text{SS(on)3}}$	$I_S=3\text{A}, V_{GS}=3.1\text{V}$	Test Circuit 5	24	33	$\text{m}\Omega$	
	$R_{\text{SS(on)4}}$	$I_S=3\text{A}, V_{GS}=2.5\text{V}$	Test Circuit 5	28	39	$\text{m}\Omega$	
Turn-ON Delay Time	$t_{\text{d(on)}}$	See specified Test Circuit.	Test Circuit 7		13	ns	
Rise Time	t_r				235	ns	
Turn-OFF Delay Time	$t_{\text{d(off)}}$				335	ns	
Fall Time	t_f				360	ns	
Total Gate Charge	Q_g	$V_{SS}=10\text{V}, V_{GS}=4.5\text{V}, I_S=6\text{A}$			8.8	nC	
Forward Source-to-Source Voltage	$V_{F(\text{S-S})}$	$I_S=6\text{A}, V_{GS}=0\text{V}$	Test Circuit 6		1	1.2	V

Ordering Information

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

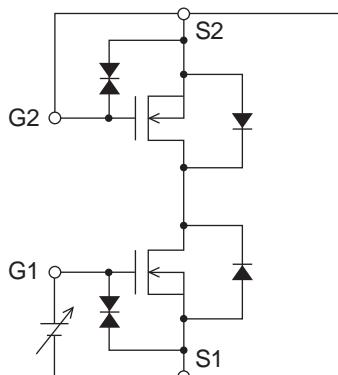
Test circuits are example of measuring FET1 side

Test Circuit 1

 V_{SSS} / I_{SSS} 

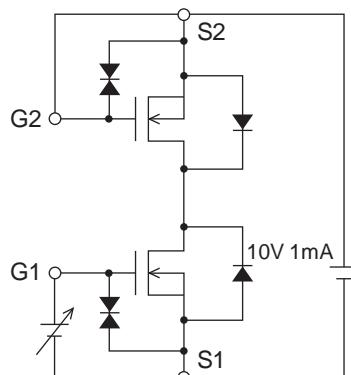
IT11565

Test Circuit 2

 $|I_{\text{GSS}}(+)/(-)|$ 

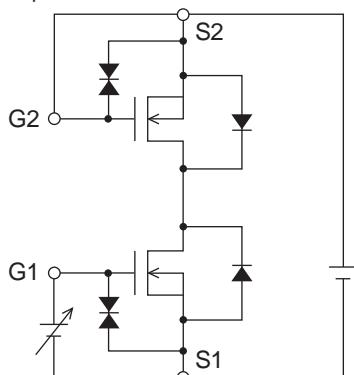
IT11566

Test Circuit 3

 $V_{GS(\text{off})}$ 

IT11567

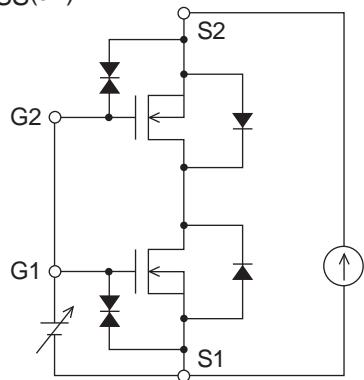
Test Circuit 4

 $|y_{\text{fs}}|$ 

IT11568

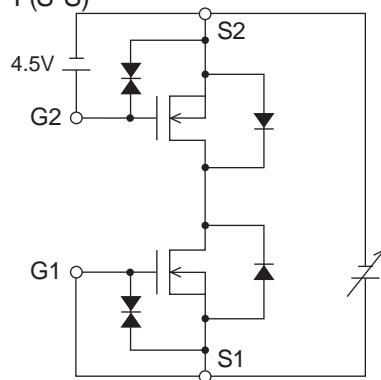
* Note: Connect the measurement terminal reversely if you want to measure the FET2 side.

Test Circuit 5



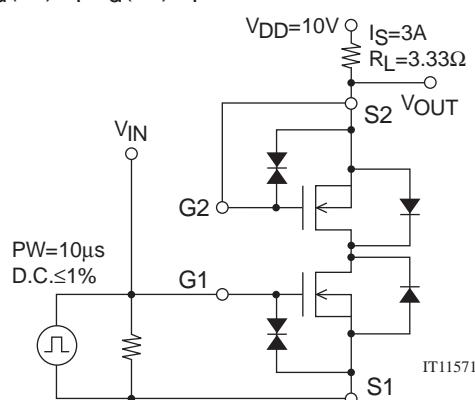
IT11569

Test Circuit 6



IT11570

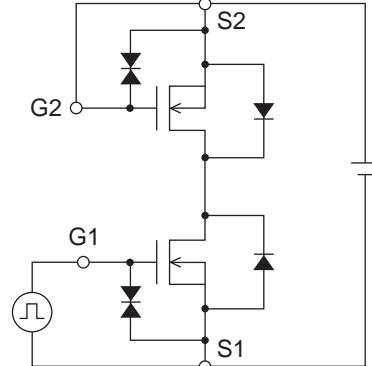
Test Circuit 7



IT11571

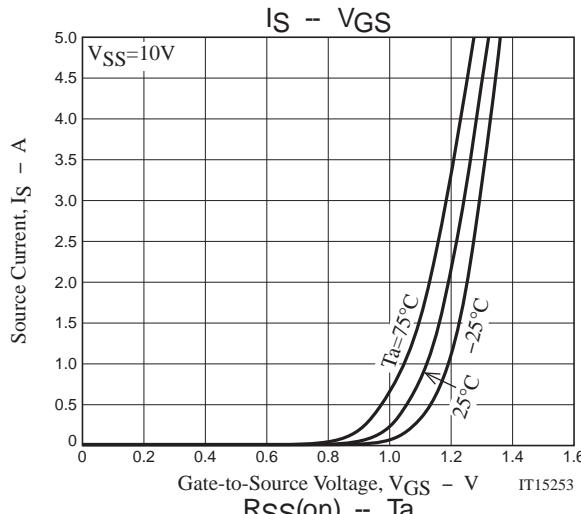
Test Circuit 8

Qg

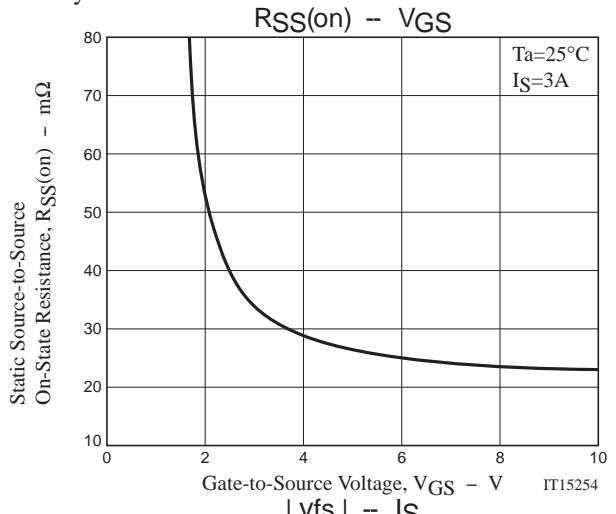


IT15409

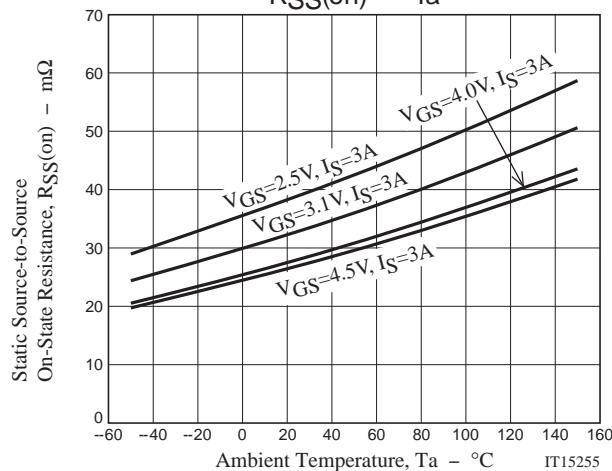
* Note: Connect the measurement terminal reversely if you want to measure the FET2 side.



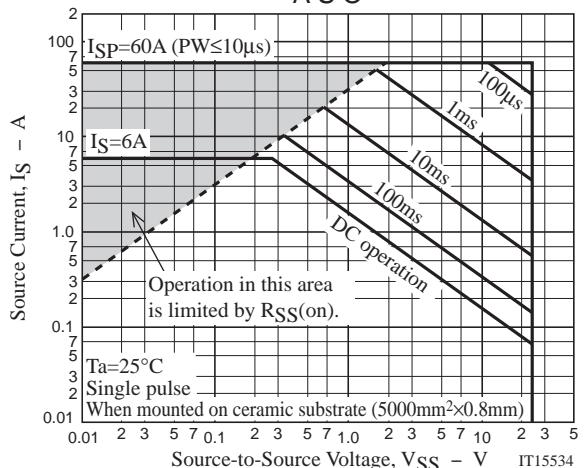
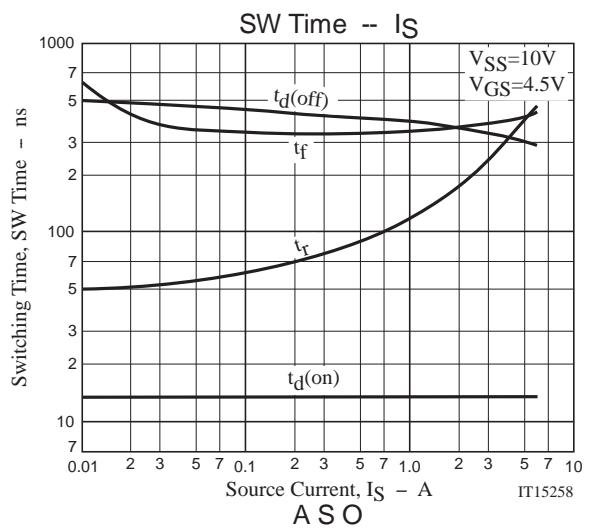
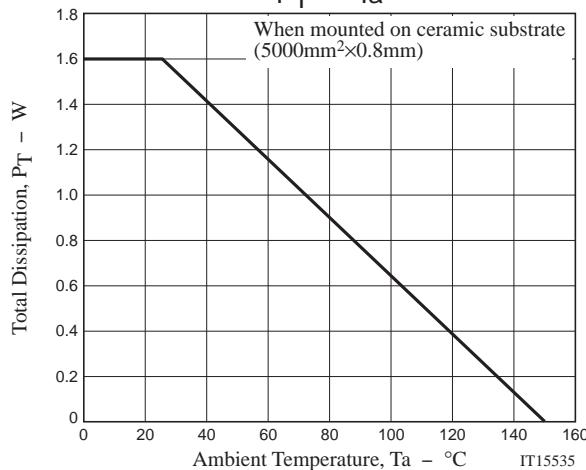
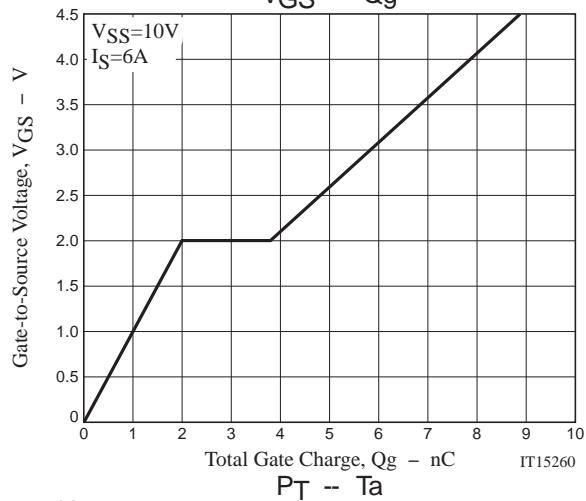
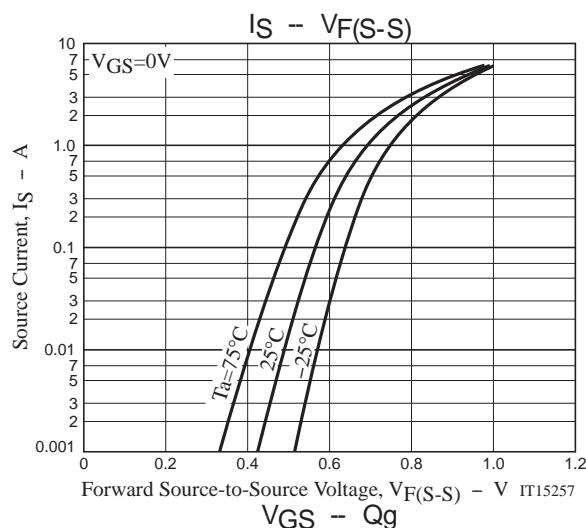
S - V IT15253



Ta=25°C



The graph plots Forward Transfer Admittance $|y_{fs}|$ on the y-axis (ranging from 1.0 to 10) against Source Current I_S in Amperes on a logarithmic x-axis (ranging from 0.1 to 10). Three curves are shown for different ambient temperatures: $T_a = -25^\circ\text{C}$ (top), 25°C (middle), and 75°C (bottom). All curves show an increasing trend of $|y_{fs}|$ with increasing I_S .

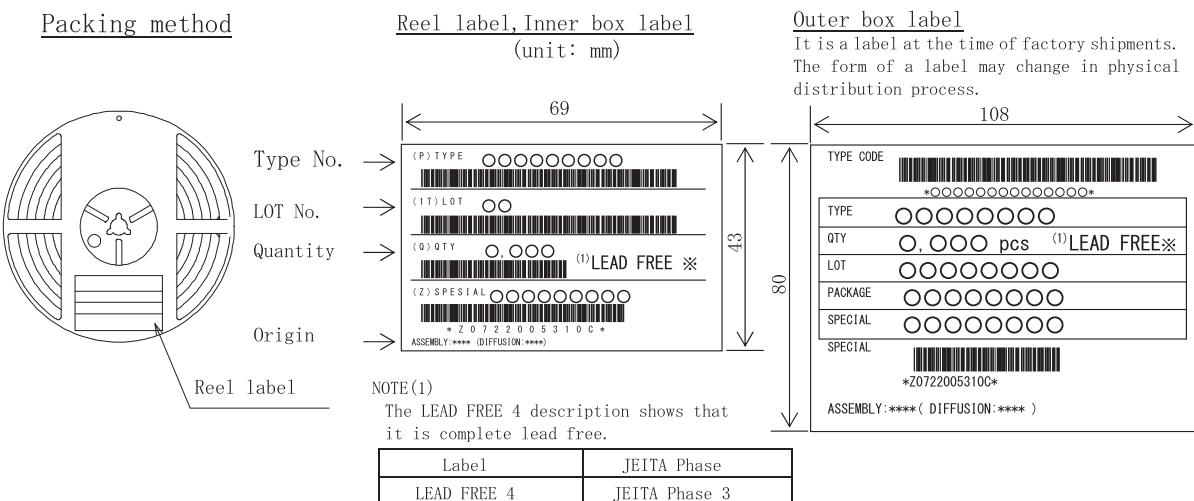


Taping Specification

EFC4615R-TR

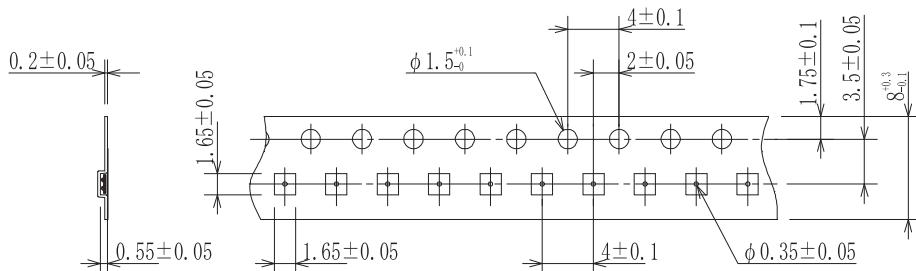
1. Packing Format

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

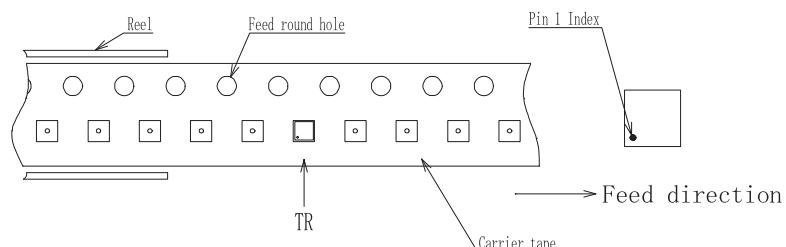


2. Taping configuration

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

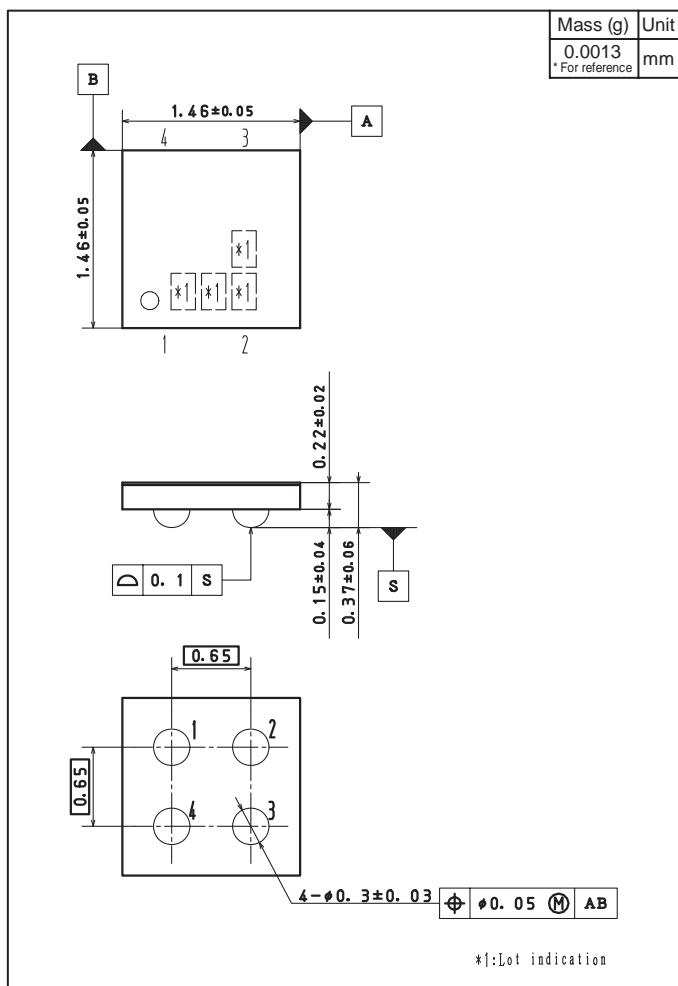


2-2. Device placement direction

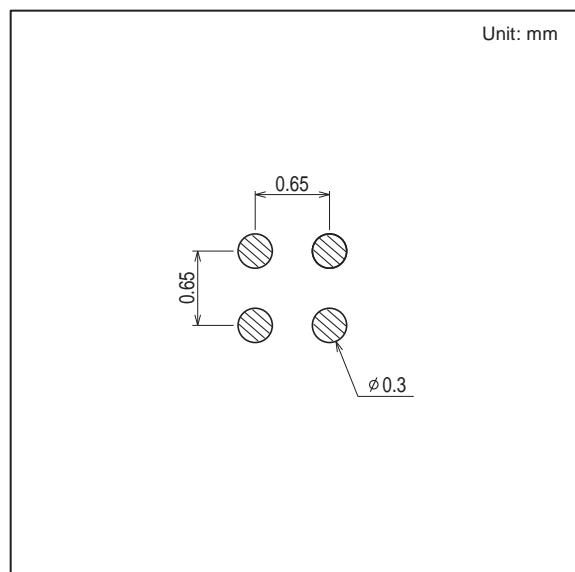


Outline Drawing

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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