Ordering number : ENA2320

EFC4630R

Advance Information

ON Semiconductor®

http://onsemi.com

N-Channel Power MOSFET
24V, 6A, 45mΩ, Dual EFCP

Features

- 2.5V drive
- Built-in gate protection resistor
- Best suited for LiB charging and discharging switch
- Common-drain type
- Halogen free compliance

Specifications

Absolute Maximum Ratings at Ta=25°C

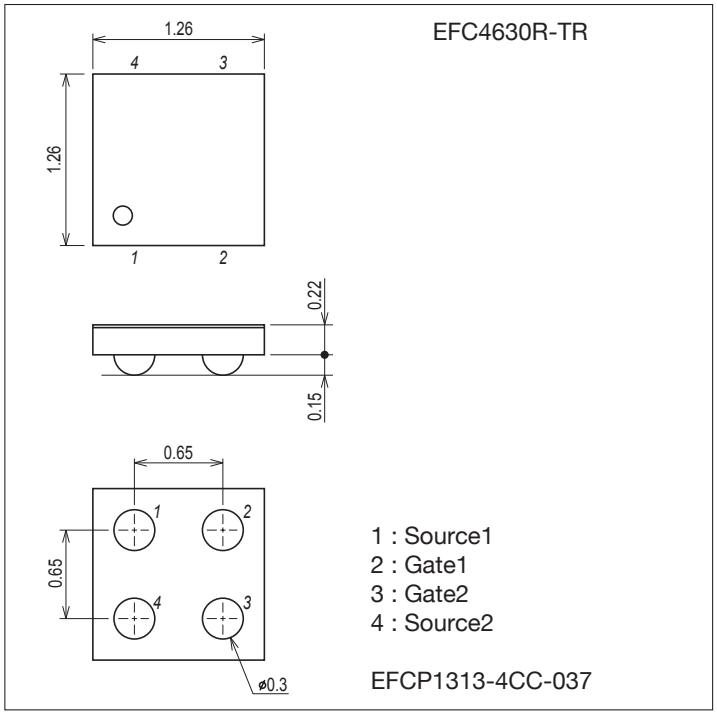
Parameter	Symbol	Conditions	Value	Unit
Source-to-Source Voltage	V_{SSS}		24	V
Gate-to-Source Voltage	V_{GSS}		±12	V
Source Current (DC)	I_S		6	A
Source Current (Pulse)	I_{SP}	PW≤10μs, duty cycle≤1%	60	A
Total Dissipation	P_T	When mounted on ceramic substrate (5000mm²×0.8mm)	1.6	W
Junction Temperature	Tj		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)

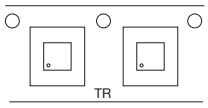
7064-001



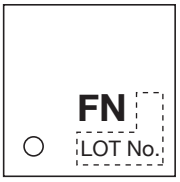
Product & Package Information

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

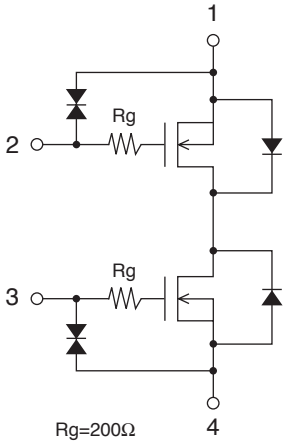
Taping Type : TR



Marking



Electrical Connection



This document contains information on a new product.
Specifications and information herein are subject to change without notice.

ORDERING INFORMATION

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

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions		Value			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			±10	μA
Gate Threshold Voltage	V_{GS}(th)	V_{SS}=10V, I_S=1mA	Test Circuit 3	0.5		1.3	V
Forward Transconductance	g_{FS}	V_{SS}=10V, I_S=3A	Test Circuit 4		3.1		S
Static Source-to-Source On-State Resistance	R_{SS}(on)1	I_S=3A, V_{GS}=4.5V	Test Circuit 5	24	39	45	mΩ
	R_{SS}(on)2	I_S=3A, V_{GS}=4.0V	Test Circuit 5	25	41	48	mΩ
	R_{SS}(on)3	I_S=3A, V_{GS}=3.7V	Test Circuit 5	27.5	43	50	mΩ
	R_{SS}(on)4	I_S=3A, V_{GS}=3.1V	Test Circuit 5	31.5	48	57	mΩ
	R_{SS}(on)5	I_S=3A, V_{GS}=2.5V	Test Circuit 5	33.5	58	72	mΩ
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.	Test Circuit 6		20		ns
Rise Time	t_r				230		ns
Turn-OFF Delay Time	t_d(off)				130		ns
Fall Time	t_f				210		ns
Total Gate Charge	Qg	V_{SS}=10V, V_{GS}=4.5V, I_S=6A	Test Circuit 7		7		nC
Forward Source-to-Source Voltage	$V_{F(S-S)}$	I_S=3A, V_{GS}=0V	Test Circuit 8		0.8	1.2	V

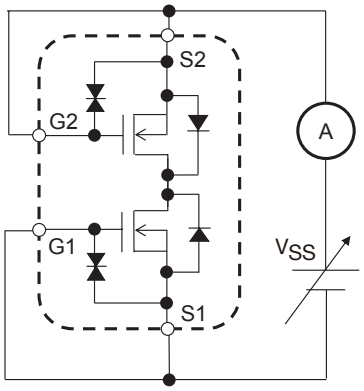
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

Ordering Information

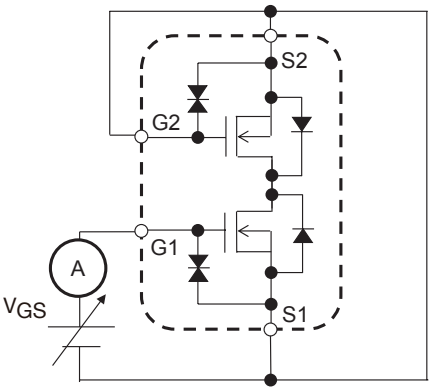
Device	Package	Shipping	memo
EFC4630R-TR	EFCP	5,000pcs./reel	Pb-Free and Halogen Free

Test circuits are example of measuring FET1 side

Test Circuit 1
I_{SSS}

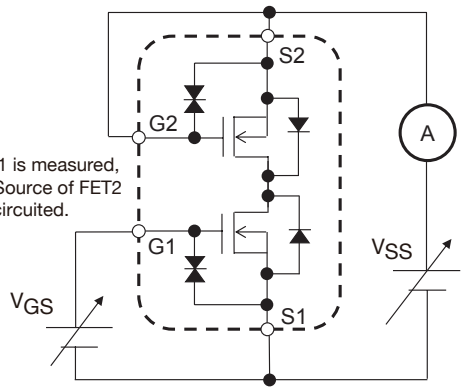


Test Circuit 2
I_{GSS}



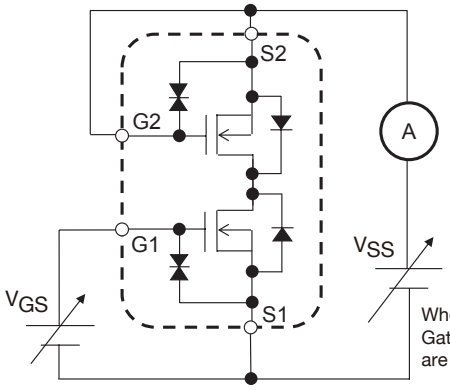
When FET1 is measured, Gate and Source of FET2 are short-circuited.

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



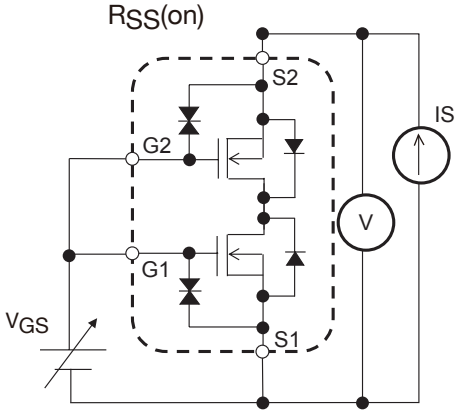
When FET1 is measured, Gate and Source of FET2 are short-circuited.

Test Circuit 4
g_{FS}

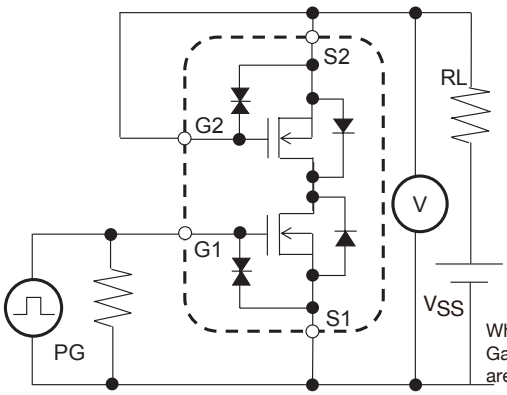


When FET1 is measured, Gate and Source of FET2 are short-circuited.

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

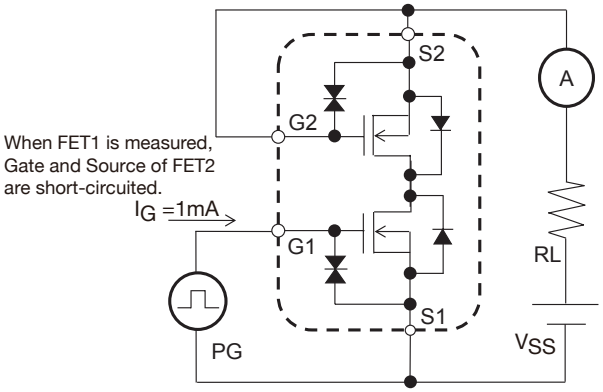


Test Circuit 6
$t_{d(on)}$, t_r, $t_{d(off)}$, t_f



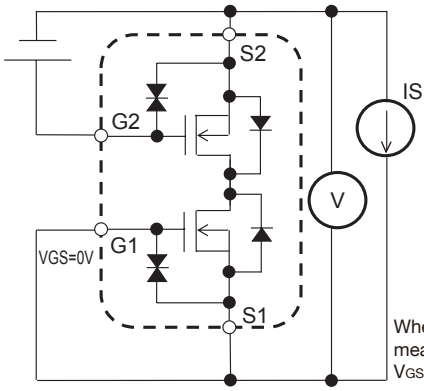
When FET1 is measured, Gate and Source of FET2 are short-circuited.

Test Circuit 7
Qg



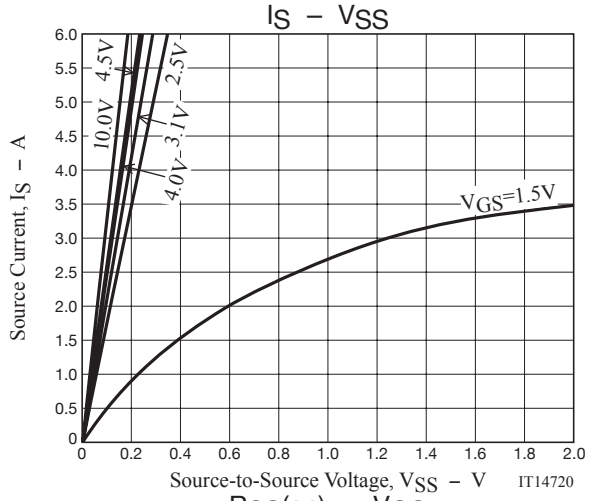
When FET1 is measured, Gate and Source of FET2 are short-circuited.

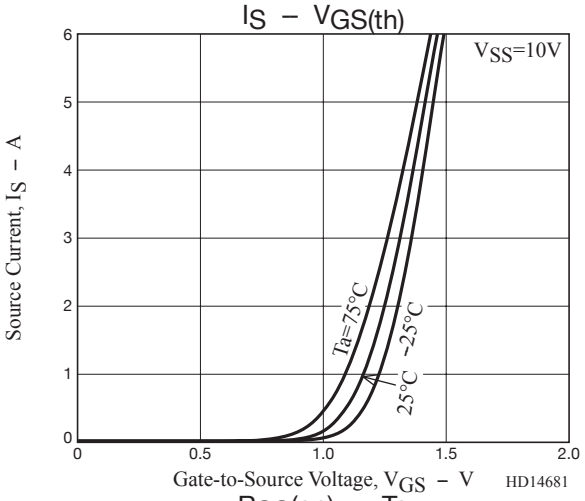
Test Circuit 8
$V_{F(S-S)}$

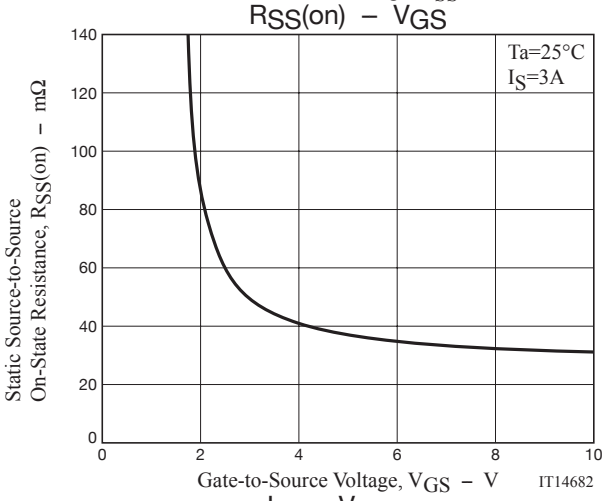


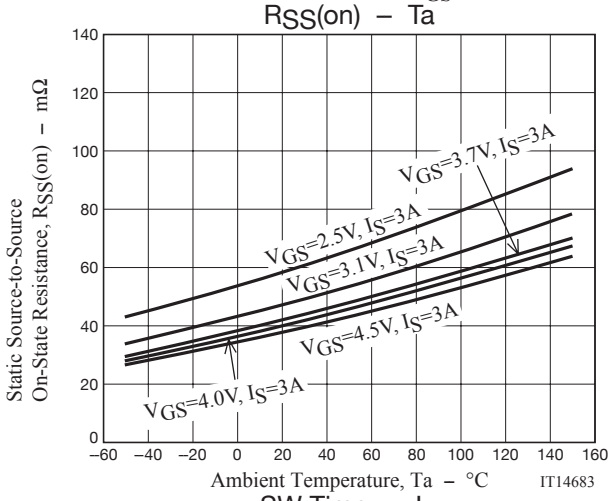
When FET1 is measured,+4.5V is added to V_{GS} of FET2.

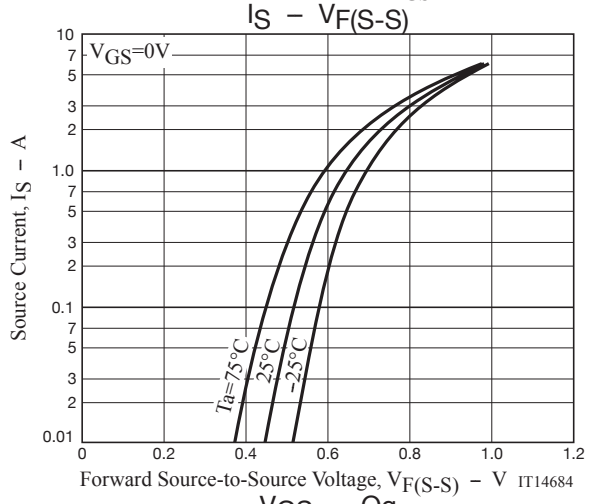
When FET2 is measured, the position of FET 1 and FET 2 is switched.

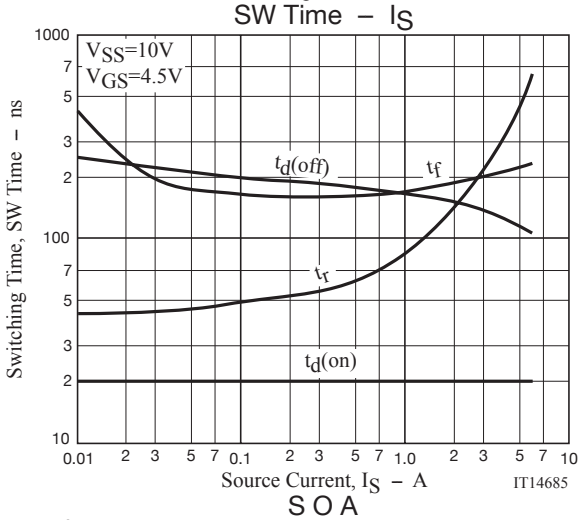

IS – VSS
Source Current, IS – A
Source-to-Source Voltage, VSS – V
IT14720
10.0V
4.5V
4.0V
3.1V
2.5V
VGS=1.5V

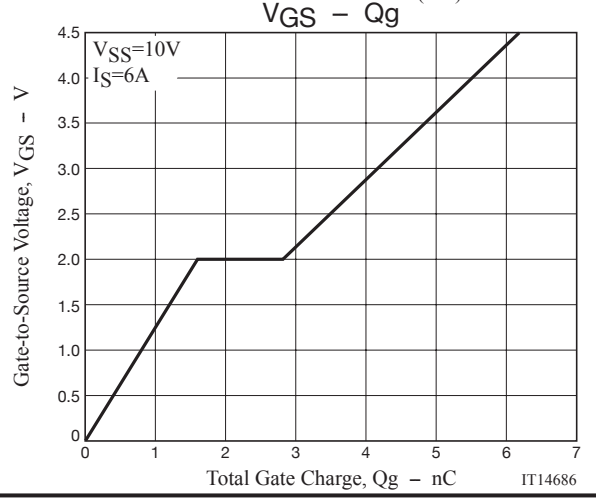

IS – VGS(th)
Source Current, IS – A
Gate-to-Source Voltage, VGS – V
HD14681
VSS=10V
Ta=75°C
25°C
–25°C

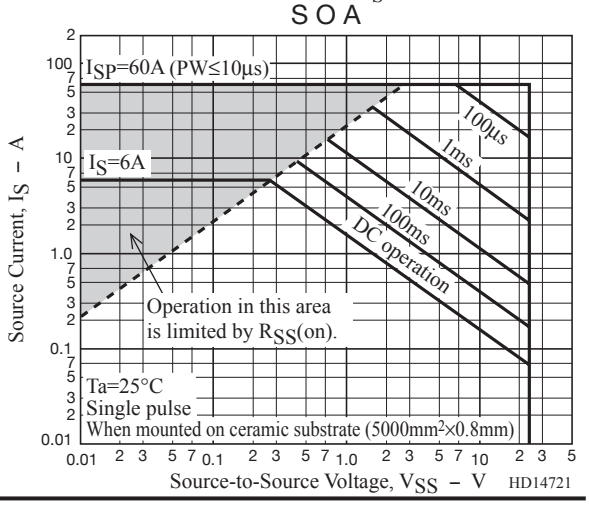

RSS(on) – VGS
Static Source-to-Source
On-State Resistance, RSS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT14682
Ta=25°C
IS=3A

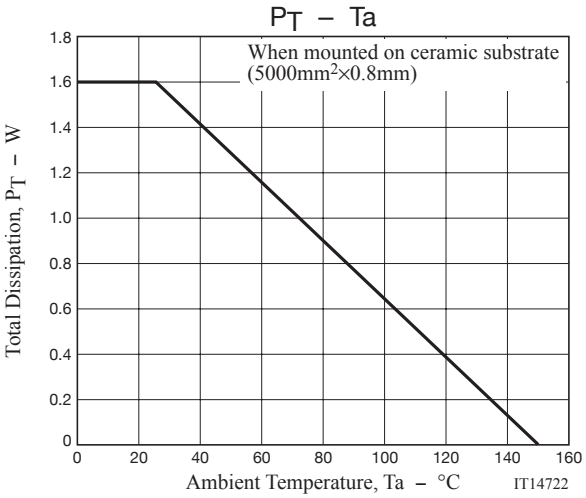

RSS(on) – Ta
Static Source-to-Source
On-State Resistance, RSS(on) – mΩ
Ambient Temperature, Ta – °C
IT14683
VGS=3.7V, IS=3A
VGS=2.5V, IS=3A
VGS=3.1V, IS=3A
VGS=4.5V, IS=3A
VGS=4.0V, IS=3A


IS – VF(S-S)
Source Current, IS – A
Forward Source-to-Source Voltage, VF(S-S) – V
IT14684
VGS=0V
Ta=75°C
25°C
–25°C


SW Time – IS
Switching Time, SW Time – ns
Source Current, IS – A
IT14685
VSS=10V
VGS=4.5V
td(off)
tf
tr
td(on)

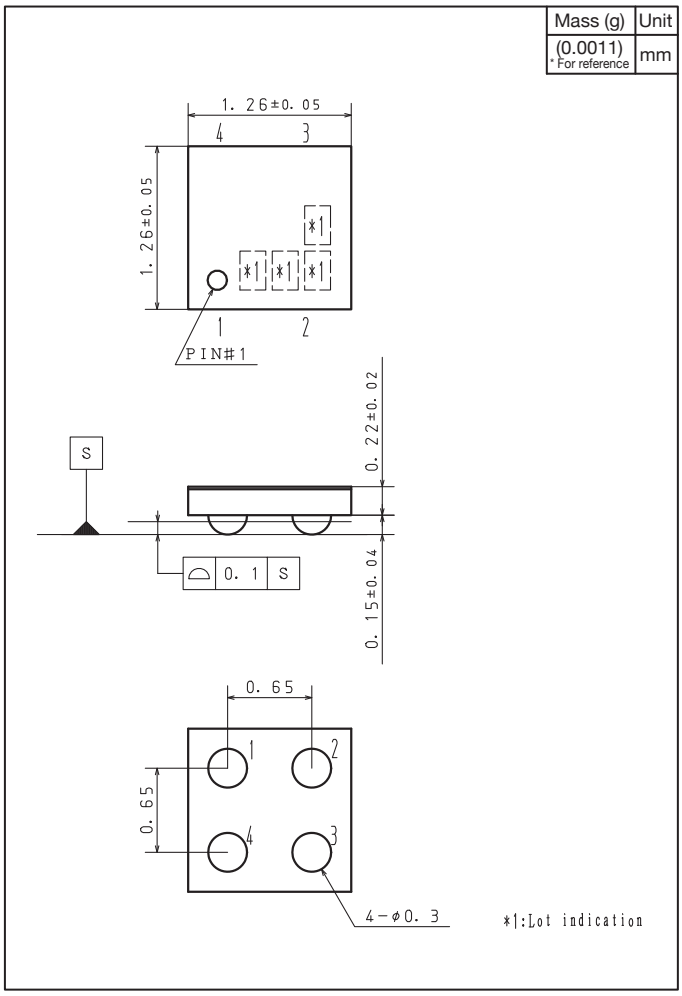

VGS – Qg
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT14686
VSS=10V
IS=6A


S O A
Source Current, IS – A
Source-to-Source Voltage, VSS – V
HD14721
ISP=60A (PW≤10μs)
IS=6A
100μs
1ms
10ms
100ms
DC operation
Operation in this area
is limited by RSS(on).
Ta=25°C
Single pulse
When mounted on ceramic substrate (5000mm²×0.8mm)

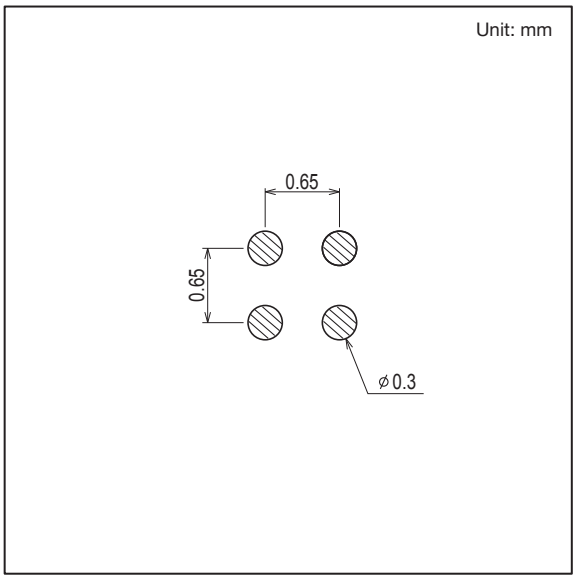

PT – Ta
When mounted on ceramic substrate
(5000mm2×0.8mm)
Total Dissipation, PT – W
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0
0
20
40
60
80
100
120
140
160
Ambient Temperature, Ta – °C
IT14722

Outline Drawing

EFC4630R-TR



Land Pattern Example



Note on usage : Since the EFC4630R is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.