Ordering number : ENA2180A

EFC4621R

Power MOSFET
24V, 9A, 18mΩ 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

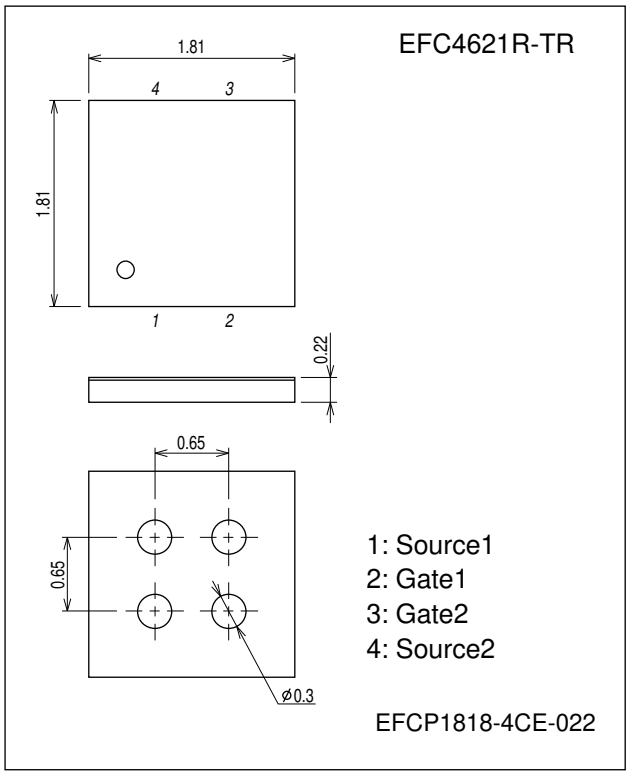
Absolute Maximum Ratings at Ta = 25°C

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		9	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	Tch		150	°C
Storage Temperature	Tstg		- 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

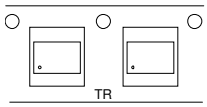
unit : mm (typ)



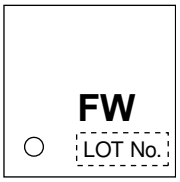
Ordering & Package Information

Device	Package	Shipping	note
EFC4621R-TR	EFCP	5000 pcs. / reel	Pb-Free and Halogen-Free

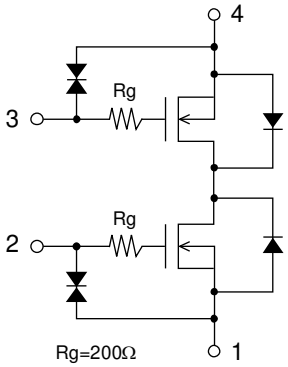
Packing Type: TR



Marking



Electrical Connection

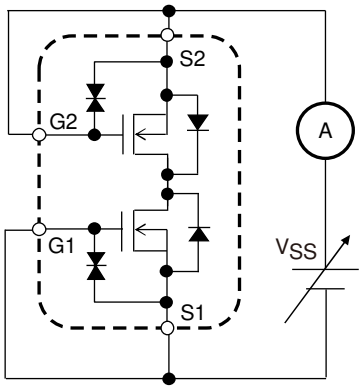


Electrical Characteristics at Ta = 25°C

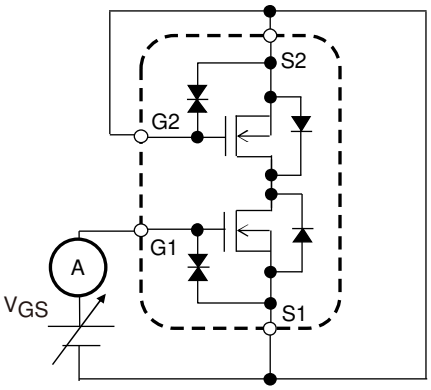
Parameter	Symbol	Conditions		Ratings			Unit
				min	typ	max	
Source to Source Breakdown Voltage	$V_{(BR)SSS}$	I_S=1mA, V_{GS}=0V	Test Circuit 1	24			V
Zero-Gate Voltage Source Current	I_{SSS}	V_{SS}=20V, V_{GS}=0V	Test Circuit 1			1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{SS}=0V	Test 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	| yfs |	V_{SS}=10V, I_S=3A	Test Circuit 4		7.3		S
Static Source to Source On-State Resistance	R_{SS}(on)1	I_S=3A, V_{GS}=4.5V	Test Circuit 5	10.8	15.5	18	mΩ
	R_{SS}(on)2	I_S=3A, V_{GS}=4.0V	Test Circuit 5	11.1	16	19	mΩ
	R_{SS}(on)3	I_S=3A, V_{GS}=3.7V	Test Circuit 5	11.5	16.5	20	mΩ
	R_{SS}(on)4	I_S=3A, V_{GS}=3.1V	Test Circuit 5	12.5	18	23.5	mΩ
	R_{SS}(on)5	I_S=3A, V_{GS}=2.5V	Test Circuit 5	14.9	23	30	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				600		ns
Turn-OFF Delay Time	t_d(off)				26000		ns
Fall Time	t_f				28000		ns
Total Gate Charge	Qg	V_{SS}=10V, V_{GS}=4.5V, I_S=9A	Test Circuit 8		29		nC
Forward Source to Source Voltage	$V_{F(S-S)}$	I_S=3A, V_{GS}=0V	Test Circuit 6		0.77	1.2	V

Test circuits are example of measuring FET1 side

Test Circuit 1
I_{SSS}

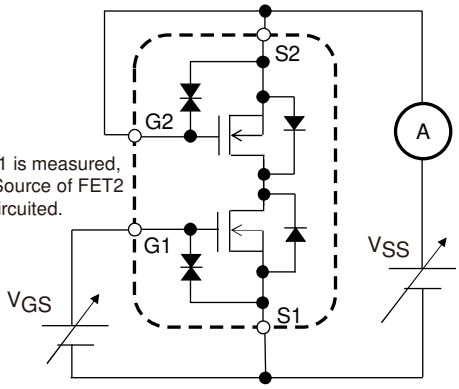


Test Circuit 2
I_{GSS}



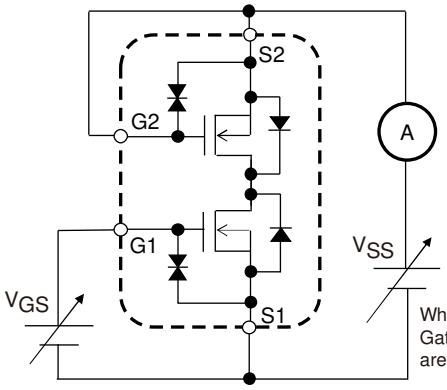
When FET1 is measured, Gate and Source of FET2 are short-circuited.

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



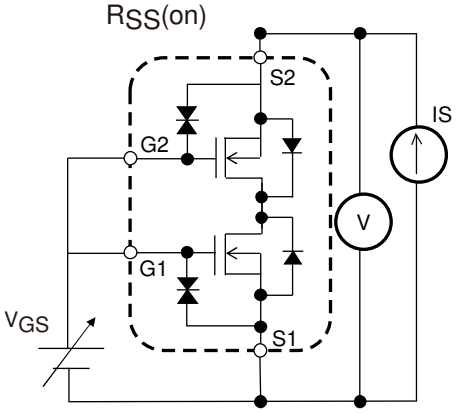
When FET1 is measured, Gate and Source of FET2 are short-circuited.

Test Circuit 4
| yfs |

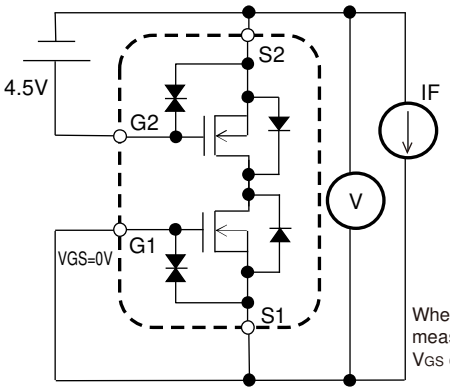


When FET1 is measured, Gate and Source of FET2 are short-circuited.

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

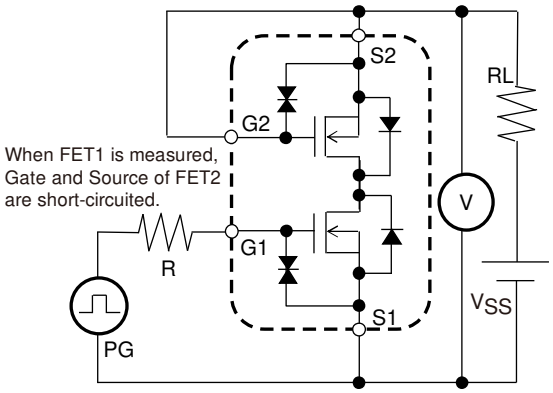


Test Circuit 6
$V_{F(S-S)}$



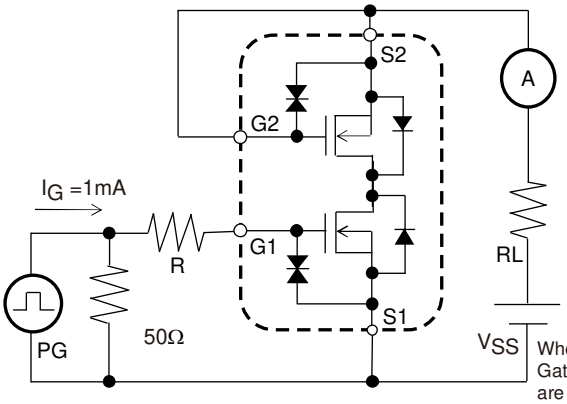
When FET1 is measured,+4.5V is added to V_{GS} of FET2.

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

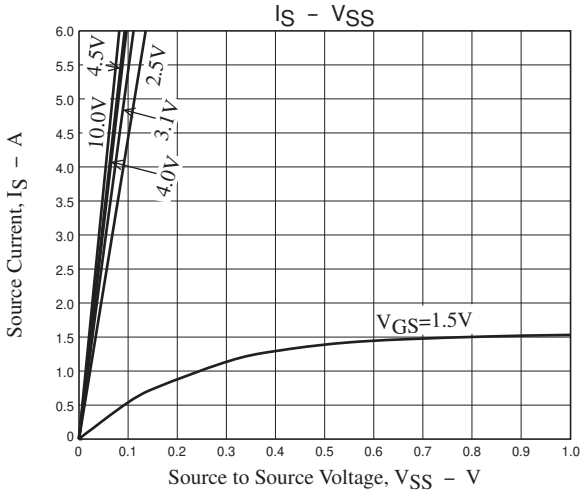


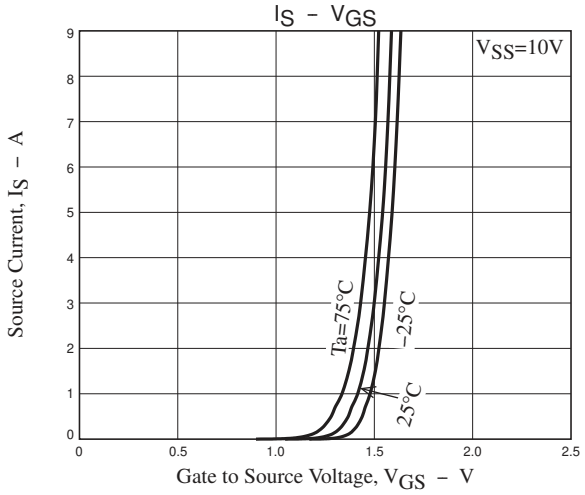
When FET1 is measured, Gate and Source of FET2 are short-circuited.

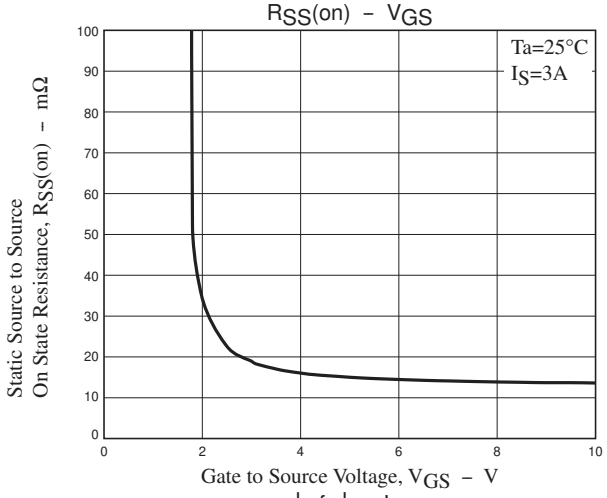
Test Circuit 8
Qg

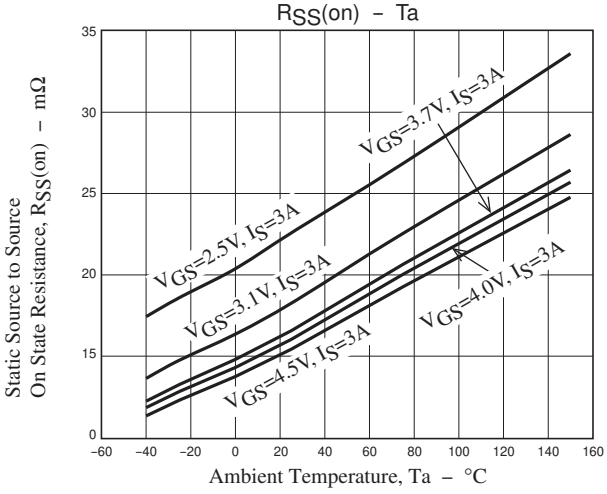


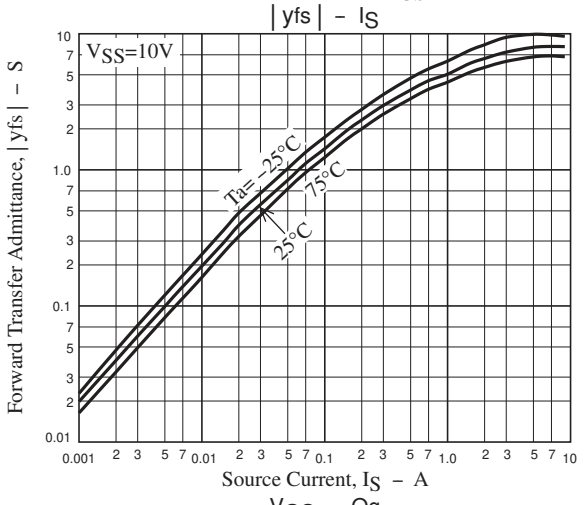
When FET1 is measured, Gate and Source of FET2 are short-circuited.

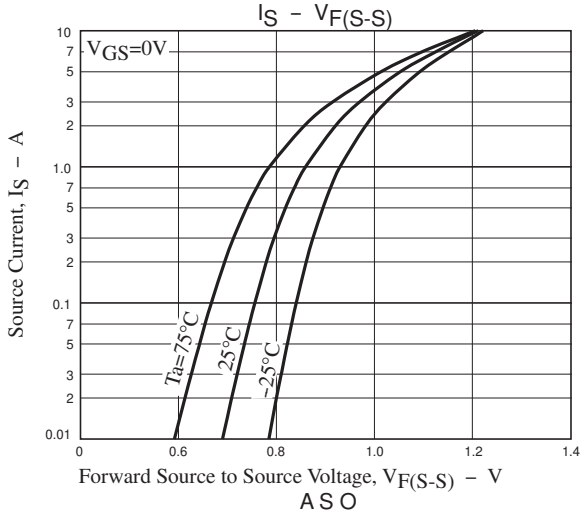

IS – VSS
Source Current, IS – A
Source to Source Voltage, VSS – V
10.0V
4.5V
4.0V
3.1V
2.5V
VGS=1.5V

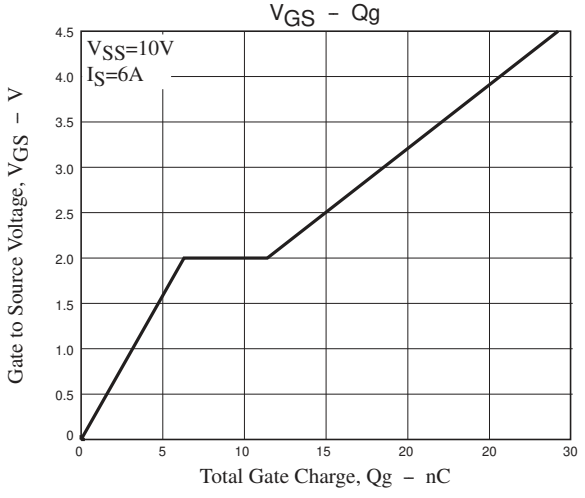

IS – VGS
VSS=10V
Source Current, IS – A
Gate to Source Voltage, VGS – V
Ta=75°C
25°C
–25°C

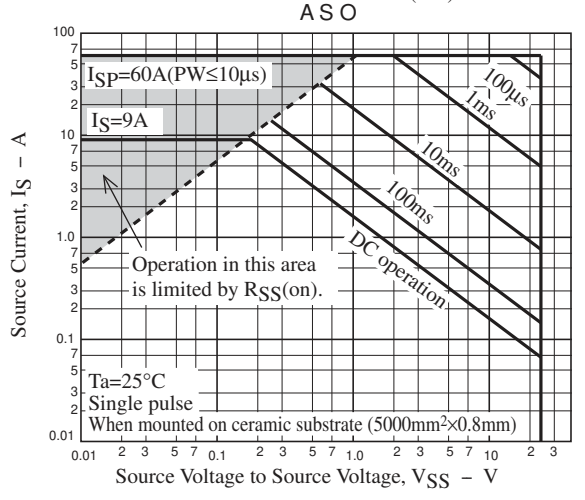

RSS(on) – VGS
Ta=25°C
IS=3A
Static Source to Source
On State Resistance, RSS(on) – mΩ
Gate to Source Voltage, VGS – V

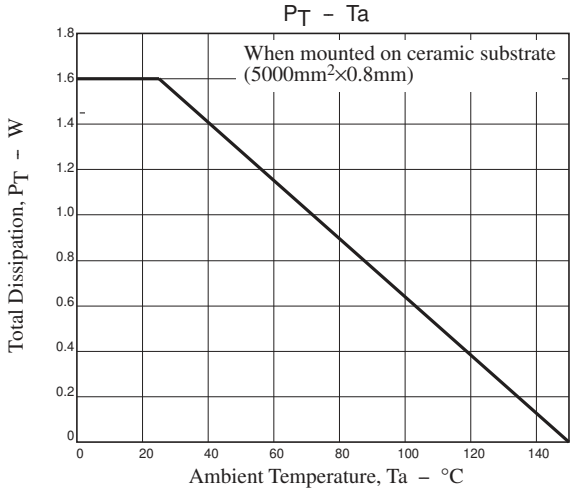

RSS(on) – Ta
Static Source to Source
On State Resistance, RSS(on) – mΩ
VGS=3.7V, IS=3A
VGS=2.5V, IS=3A
VGS=3.1V, IS=3A
VGS=4.0V, IS=3A
VGS=4.5V, IS=3A
Ambient Temperature, Ta – °C


| yfs | – IS
VSS=10V
Forward Transfer Admittance, | yfs | – S
Ta= –25°C
25°C
75°C
Source Current, IS – A


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


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


A S O
ISP=60A(PW≤10μs)
IS=9A
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)
Source Current, IS – A
Source Voltage to Source Voltage, VSS – V

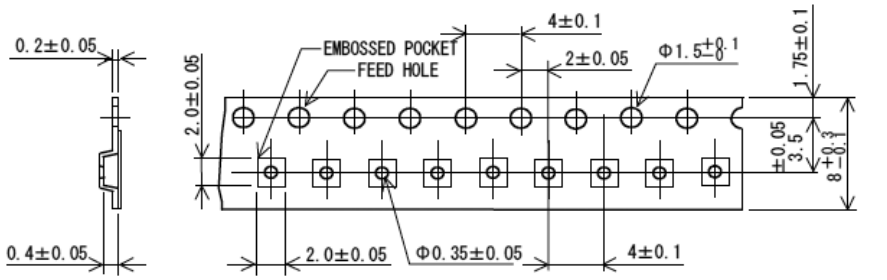

PT – Ta
When mounted on ceramic substrate
(5000mm2×0.8mm)
Total Dissipation, PT – W
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0
0
20
40
60
80
100
120
140
Ambient Temperature, Ta – °C

Taping Specification

EFC4621R-TR

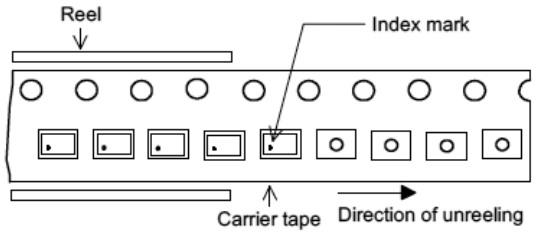
1.Taping Configuration

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



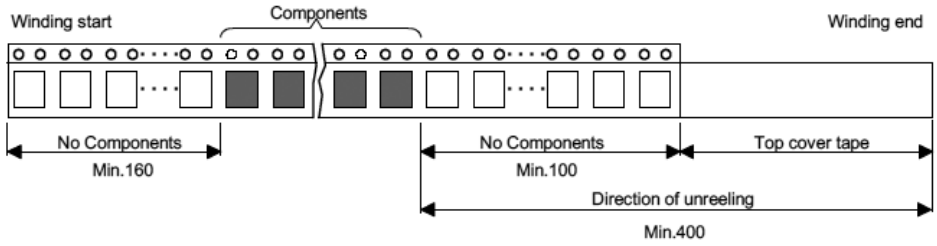
UNIT:mm

1- 2 .Device Placement Direction



Packing type····· TR

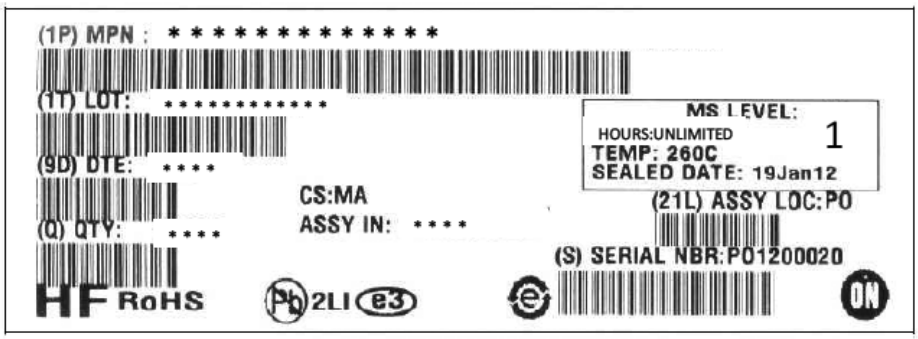
1- 3 .Leader portion and Trailer portion (unit:mm)



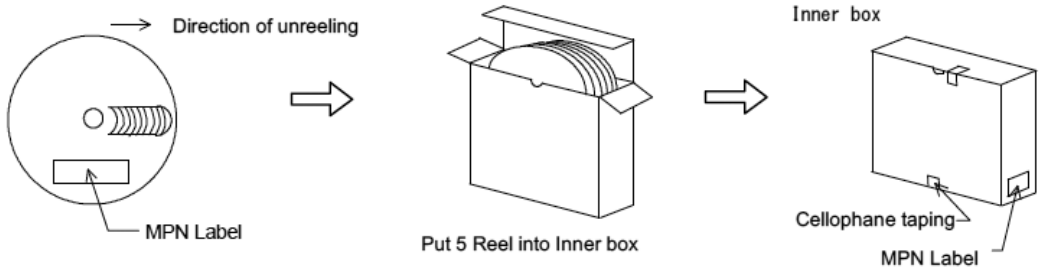
Packing Format

Carrier Tape code	Package code	Maximum Number of devices contained. (pcs.)			Packing Format	
		Reel	Inner box		Inner box BOX(C-1)	
2020X04	EFCP1818-4CE-022	5,000	25,000		5reels contained. Dimensions:mm 183×72×185	

MPN Label

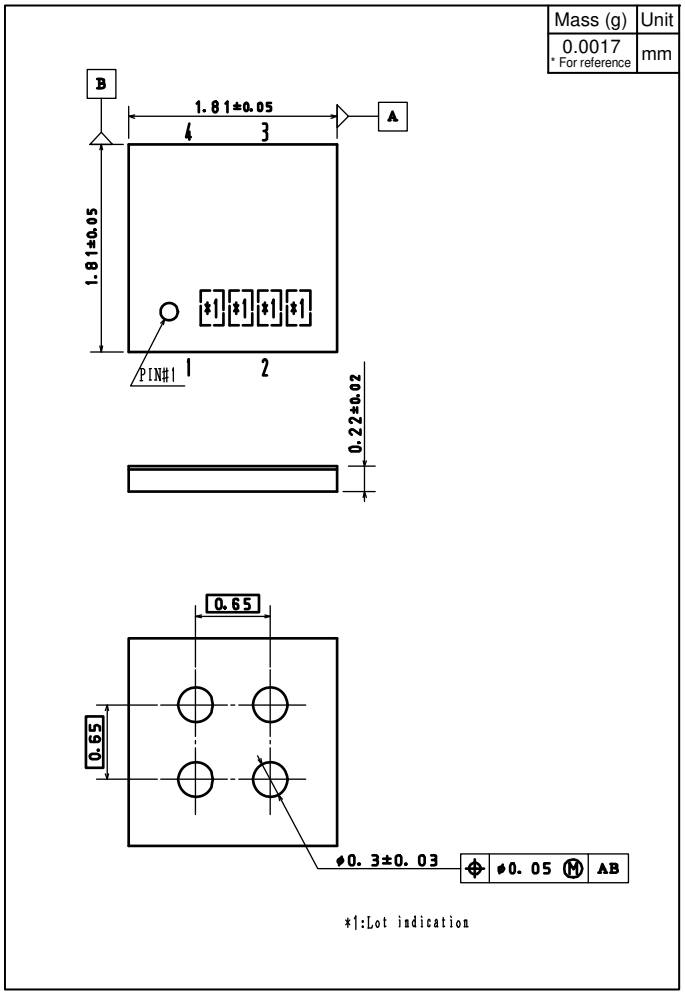


Packing Method

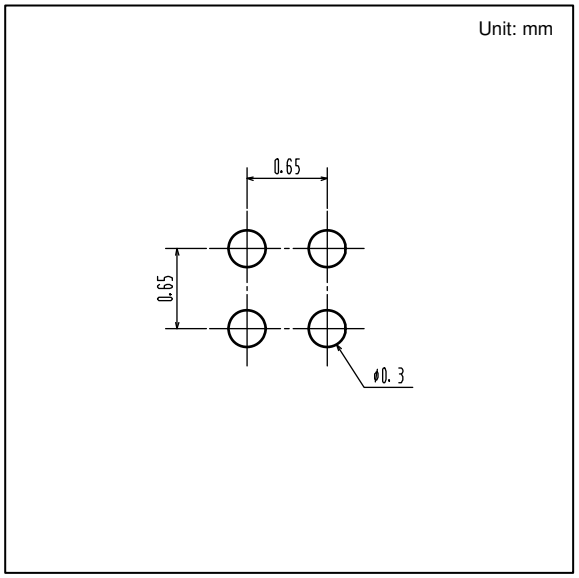


Outline Drawing

EFC4621R-TR



Land Pattern Example



Note on usage : Since the EFC4621R is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.