Ordering number : ENA2288

EFC4627R

N-Channel Power MOSFET
12V, 6A, 29.5mΩ, Dual EFCP

ON Semiconductor®

http://onsemi.com

Features

- 2.5V drive
- Protection diode in
- Common-drain type
- Halogen free compliance

Applications

- Lithium-ion battery charging and discharging switch

Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Value	Unit
Source to Source Voltage	V_{SSS}		12	V
Gate to Source Voltage	V_{GSS}		±10	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)	1.4	W
Junction Temperature	T_j		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.

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Junction to Ambient When mounted on ceramic substrate (5000mm^2×0.8mm)	$R_{\theta JA}$	84	°C /W

Electrical Characteristics at Ta = 25°C

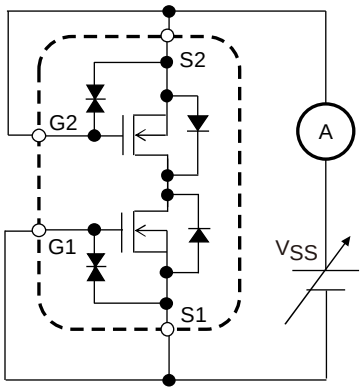
Parameter	Symbol	Conditions		Value min	Value typ	Value max	Unit
Source to Source Breakdown Voltage	$V(BR)_{SSS}$	I_S=1mA, V_{GS}=0V	Test Circuit 1	12			V
Zero-Gate Voltage Source Current	I_{SSS}	V_{SS}=10V, V_{GS}=0V	Test Circuit 1			1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{SS}=0V	Test Circuit 2			±1	μA
Gate Threshold Voltage	$V_{GS}(th)$	V_{SS}=6V, I_S=1mA	Test Circuit 3	0.5		1.3	V
Forward Transconductance	g_{FS}	V_{SS}=6V, I_S=2A	Test Circuit 4		4.8		S
Static Source to Source On-State Resistance	$R_{SS}(on)1$	I_S=2A, V_{GS}=4.5V	Test Circuit 5	18.5	23.9	29.5	mΩ
	$R_{SS}(on)2$	I_S=2A, V_{GS}=4.0V	Test Circuit 5	19.7	25.4	31.3	mΩ
	$R_{SS}(on)3$	I_S=2A, V_{GS}=3.8V	Test Circuit 5	20.3	26.1	32.3	mΩ
	$R_{SS}(on)4$	I_S=2A, V_{GS}=3.1V	Test Circuit 5	23.5	30.3	39.0	mΩ
	$R_{SS}(on)5$	I_S=2A, V_{GS}=2.5V	Test Circuit 5	29.3	37.7	50.5	mΩ
Turn-ON Delay Time	$t_d(on)$	V_{SS}=6V, V_{GS}=4.5V, I_S=2A	Test Circuit 6		75		ns
Rise Time	t_r				740		ns
Turn-OFF Delay Time	$t_d(off)$				2340		ns
Fall Time	t_f				2320		ns
Total Gate Charge	Qg	V_{SS}=6V, V_{GS}=4.5V, I_S=6A	Test Circuit 7		13.4		nC
Forward Source to Source Voltage	$V_{F(S-S)}$	I_S=3A, V_{GS}=0V	Test Circuit 8		0.76		V

ORDERING INFORMATION

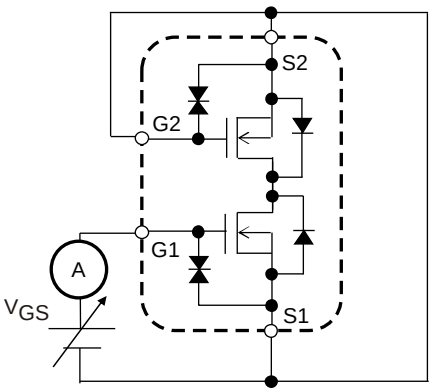
See detailed ordering and shipping information on page 5 of this data sheet.

Test circuits are example of measuring FET1 side

Test Circuit 1
I_{SSS}

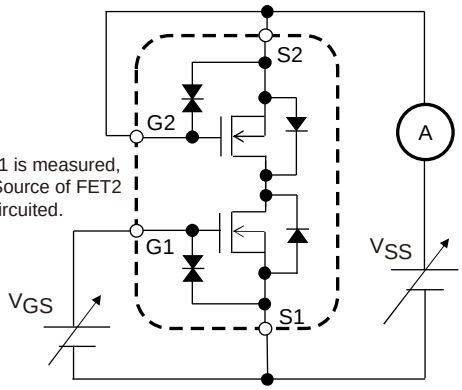


Test Circuit 2
I_{GSS}



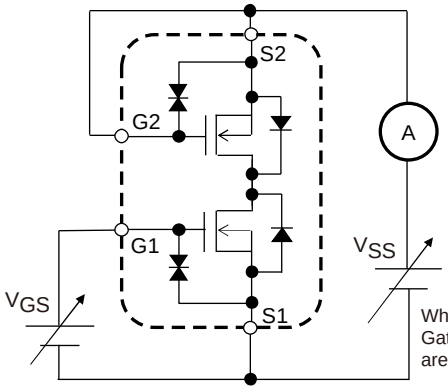
When FET1 is measured, Gate and Source of FET2 are short-circuited.

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



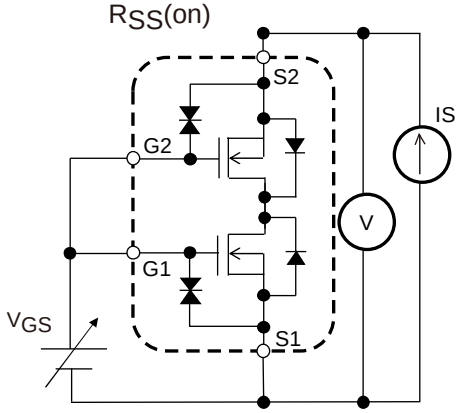
When FET1 is measured, Gate and Source of FET2 are short-circuited.

Test Circuit 4
g_{FS}

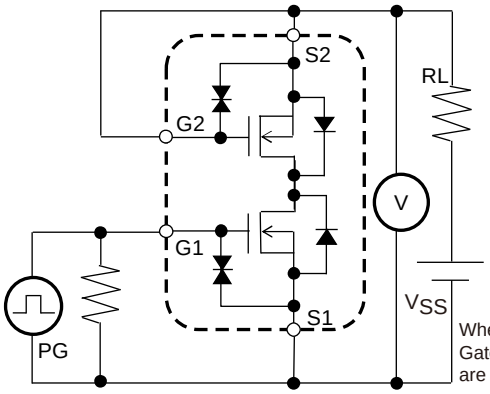


When FET1 is measured, Gate and Source of FET2 are short-circuited.

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

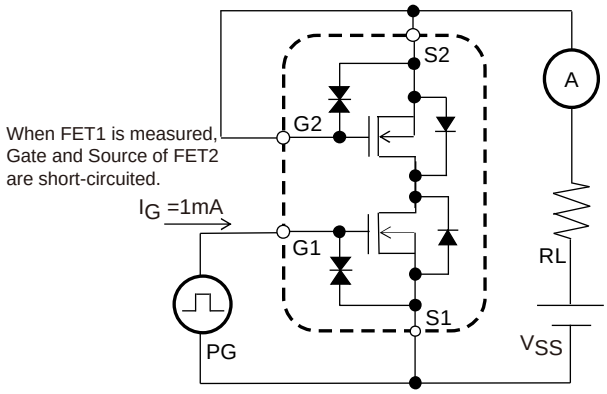


Test Circuit 6
$t_{d(on)}$, t_r, $t_{d(off)}$, t_f



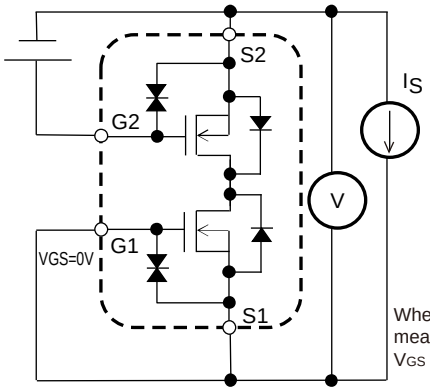
When FET1 is measured, Gate and Source of FET2 are short-circuited.

Test Circuit 7
Qg



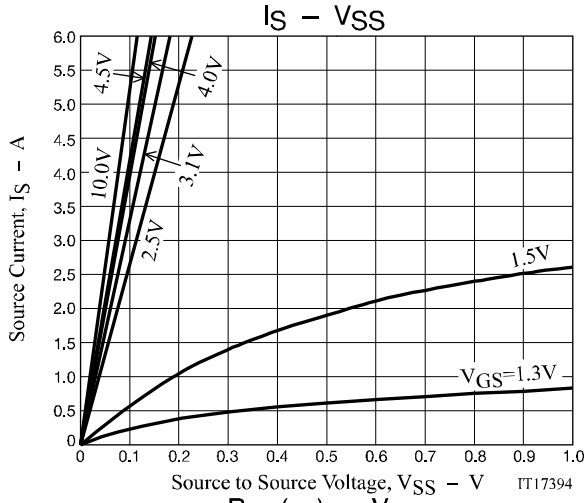
When FET1 is measured, Gate and Source of FET2 are short-circuited.

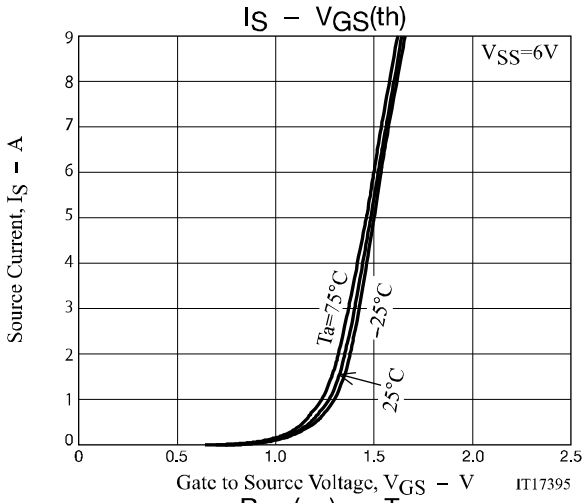
Test Circuit 8
$V_{F(S-S)}$

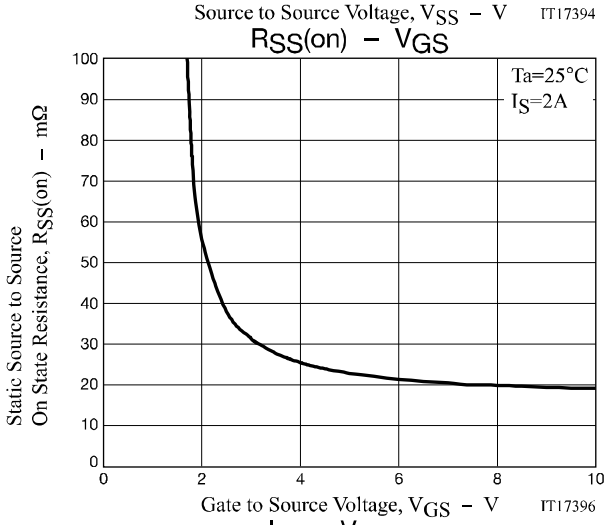


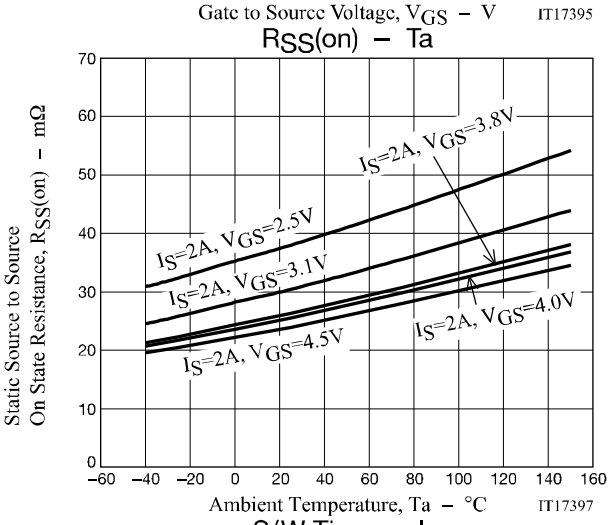
When FET1 is measured,+4.5V is added to V_{GS} of FET2.

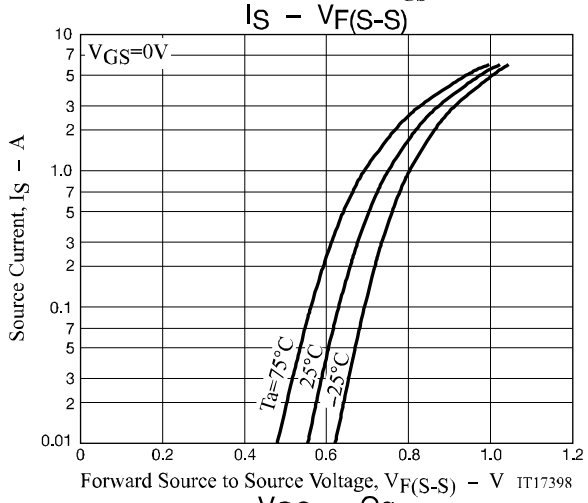
When FET2 is measured, the position of FET1 and FET2 is switched.

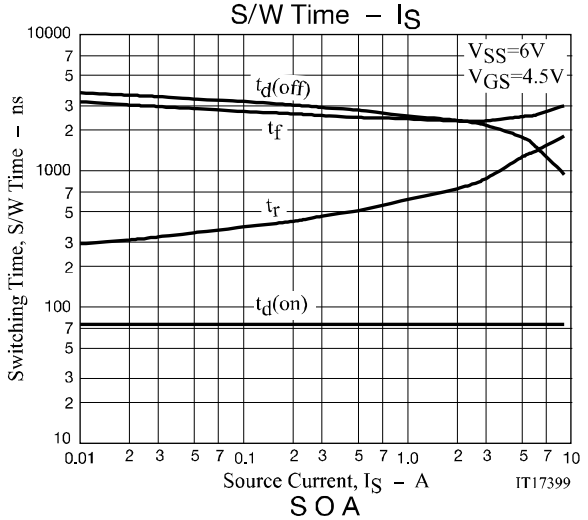

IS – VSS
Source Current, IS – A
Source to Source Voltage, VSS – V
IT17394
4.5V
4.0V
10.0V
3.1V
2.5V
1.5V
VGS=1.3V

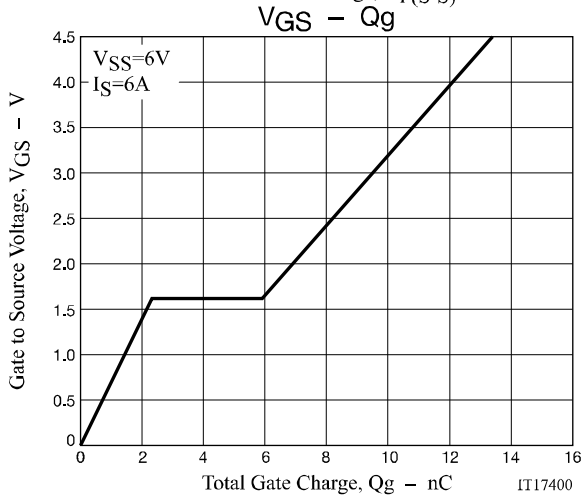

IS – VGS(th)
Source Current, IS – A
Gate to Source Voltage, VGS – V
IT17395
VSS=6V
Ta=75°C
–25°C
25°C

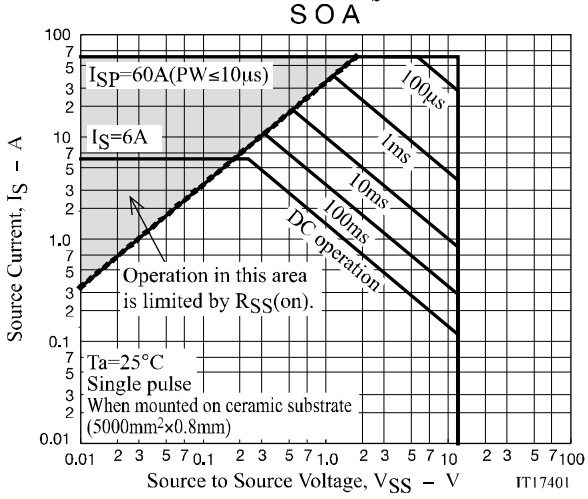

RSS(on) – VGS
Static Source to Source On State Resistance, RSS(on) – mΩ
Gate to Source Voltage, VGS – V
IT17396
Ta=25°C
IS=2A

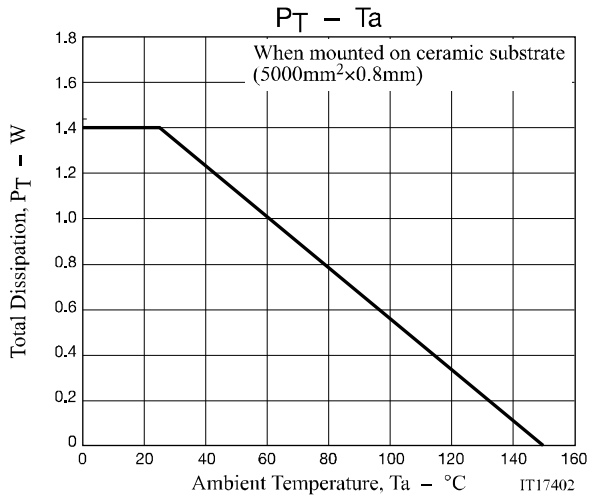

RSS(on) – Ta
Static Source to Source On State Resistance, RSS(on) – mΩ
Ambient Temperature, Ta – °C
IT17397
IS=2A, VGS=3.8V
IS=2A, VGS=2.5V
IS=2A, VGS=3.1V
IS=2A, VGS=4.0V
IS=2A, VGS=4.5V

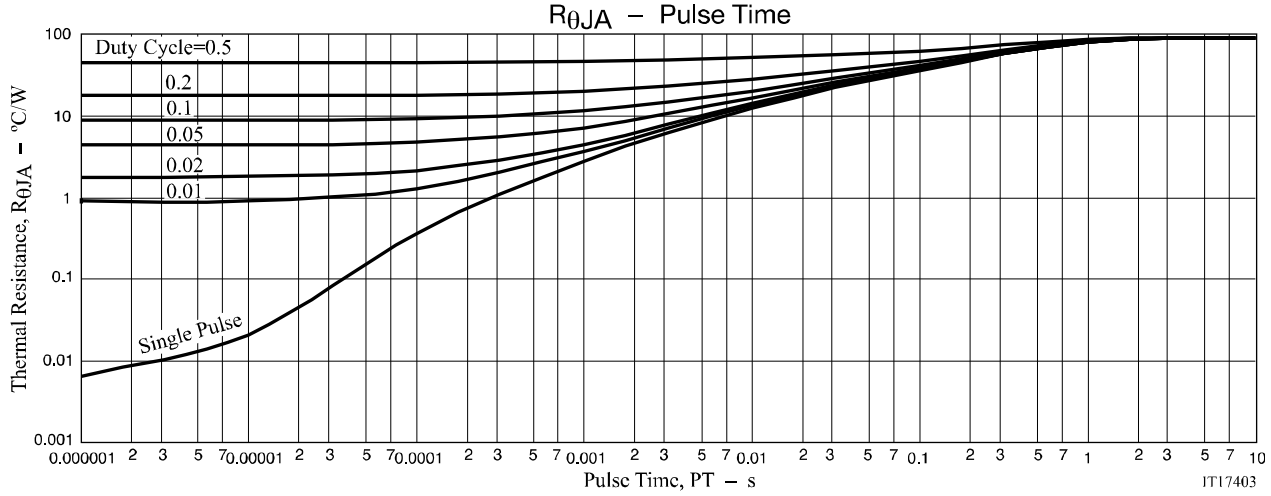

IS – VF(S-S)
Source Current, IS – A
Forward Source to Source Voltage, VF(S-S) – V
IT17398
VGS=0V
Ta=75°C
25°C
–25°C


S/W Time – IS
Switching Time, S/W Time – ns
Source Current, IS – A
IT17399
VSS=6V
VGS=4.5V
td(off)
tf
tr
td(on)


VGS – Qg
Gate to Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT17400
VSS=6V
IS=6A


S O A
Source Current, IS – A
Source to Source Voltage, VSS – V
IT17401
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
Ambient Temperature, Ta – °C
IT17402


RθJA – Pulse Time
Duty Cycle=0.5
0.2
0.1
0.05
0.02
0.01
Single Pulse
Thermal Resistance, RθJA – °C/W
Pulse Time, PT – s
IT17403

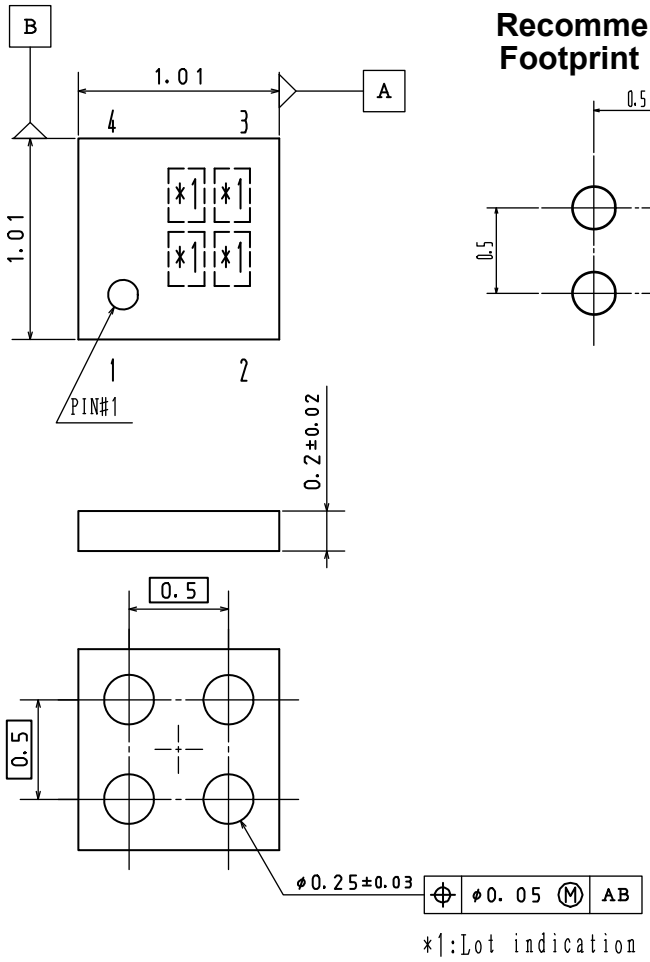
Package Dimensions

EFC4627R-TR

EFCP1010-4DG-020

Unit : mm

1: Source1
2: Gate1
3: Gate2
4: Source2

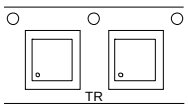


Recommended Soldering Footprint

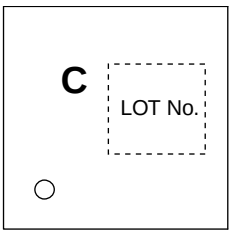
Ordering & Package Information

Device	Package	Shipping	note
EFC4627R-TR	EFCP	8,000 pcs. / reel	Pb-Free and Halogen Free

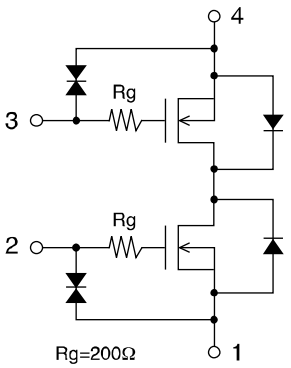
Packing Type: TR



Marking



Electrical Connection



Note on usage : Since the EFC4627R is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.