



# 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 $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Value	Unit
Source to Source Voltage	$V_{SSS}$		12	V
Gate to Source Voltage	$V_{GSS}$		$\pm 10$	V
Source Current (DC)	$I_S$		6	A
Source Current (Pulse)	$I_{SP}$	$PW \leq 10\mu\text{s}$ , duty cycle $\leq 1\%$	60	A
Total Dissipation	$P_T$	When mounted on ceramic substrate (5000mm <sup>2</sup> ×0.8mm)	1.4	W
Junction Temperature	$T_j$		150	°C
Storage Temperature	$T_{stg}$		- 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 <sup>2</sup> ×0.8mm)	$R_{\theta JA}$	84	°C /W

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

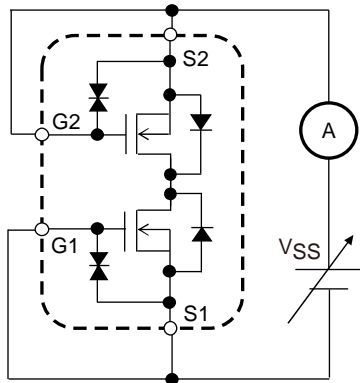
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Source to Source Breakdown Voltage	$V_{(BR)SSS}$	$I_S=1\text{mA}$ , $V_{GS}=0\text{V}$ Test Circuit 1	12			V
Zero-Gate Voltage Source Current	$I_{SSS}$	$V_{SS}=10\text{V}$ , $V_{GS}=0\text{V}$ Test Circuit 1			1	$\mu\text{A}$
Gate to Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8\text{V}$ , $V_{SS}=0\text{V}$ Test Circuit 2			$\pm 1$	$\mu\text{A}$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{SS}=6\text{V}$ , $I_S=1\text{mA}$ Test Circuit 3	0.5		1.3	V
Forward Transconductance	$g_{FS}$	$V_{SS}=6\text{V}$ , $I_S=2\text{A}$ Test Circuit 4		4.8		S
Static Source to Source On-State Resistance	$R_{SS(on)1}$	$I_S=2\text{A}$ , $V_{GS}=4.5\text{V}$ Test Circuit 5	18.5	23.9	29.5	$\text{m}\Omega$
	$R_{SS(on)2}$	$I_S=2\text{A}$ , $V_{GS}=4.0\text{V}$ Test Circuit 5	19.7	25.4	31.3	$\text{m}\Omega$
	$R_{SS(on)3}$	$I_S=2\text{A}$ , $V_{GS}=3.8\text{V}$ Test Circuit 5	20.3	26.1	32.3	$\text{m}\Omega$
	$R_{SS(on)4}$	$I_S=2\text{A}$ , $V_{GS}=3.1\text{V}$ Test Circuit 5	23.5	30.3	39.0	$\text{m}\Omega$
	$R_{SS(on)5}$	$I_S=2\text{A}$ , $V_{GS}=2.5\text{V}$ Test Circuit 5	29.3	37.7	50.5	$\text{m}\Omega$
Turn-ON Delay Time	$t_{d(on)}$	$V_{SS}=6\text{V}$ , $V_{GS}=4.5\text{V}$ , $I_S=2\text{A}$ 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	$Q_g$		$V_{SS}=6\text{V}$ , $V_{GS}=4.5\text{V}$ , $I_S=6\text{A}$ Test Circuit 7		13.4	
Forward Source to Source Voltage	$V_{F(S-S)}$	$I_S=3\text{A}$ , $V_{GS}=0\text{V}$ Test Circuit 8		0.76		V

### ORDERING INFORMATION

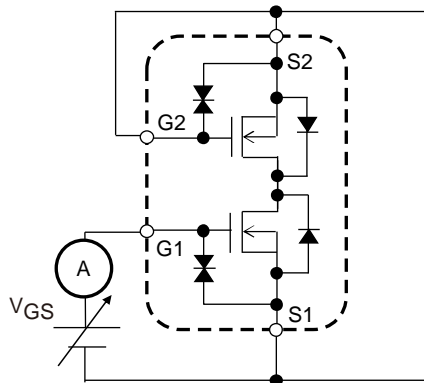
See detailed ordering and shipping information on page 5 of this data sheet.

Test circuits are example of measuring FET1 side

Test Circuit 1  
I<sub>SS</sub>

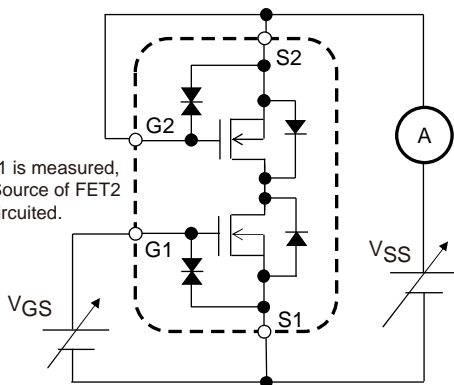


Test Circuit 2  
I<sub>GSS</sub>



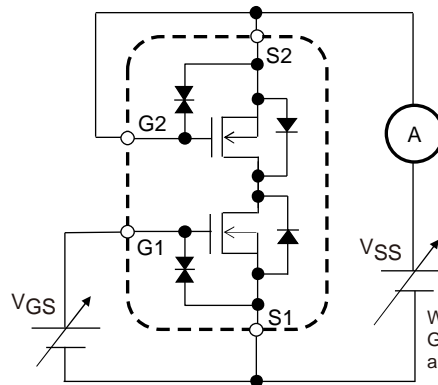
When FET1 is measured, Gate and Source of FET2 are short-circuited.

Test Circuit 3  
V<sub>GS(th)</sub>



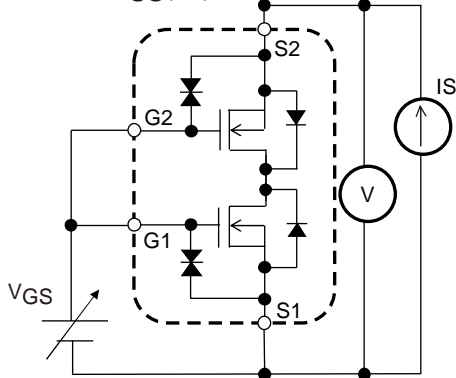
When FET1 is measured, Gate and Source of FET2 are short-circuited.

Test Circuit 4  
g<sub>FS</sub>

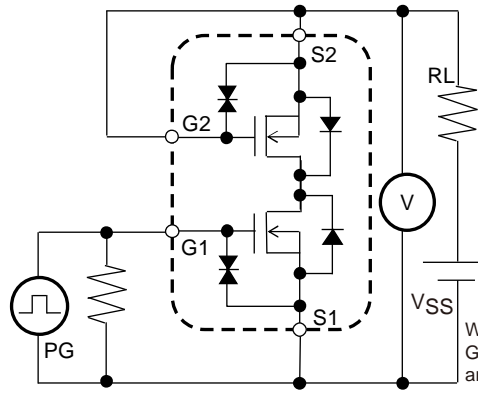


When FET1 is measured, Gate and Source of FET2 are short-circuited.

Test Circuit 5  
R<sub>SS(on)</sub>

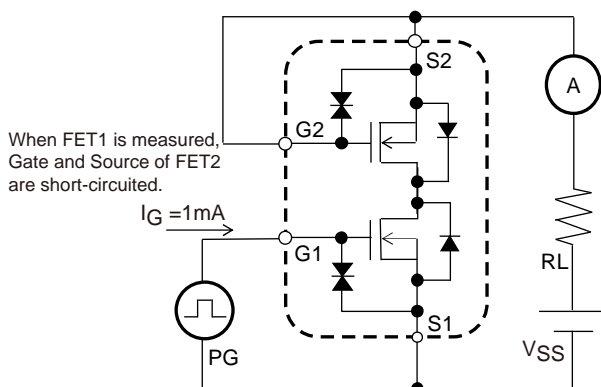


Test Circuit 6  
t<sub>d(on)</sub>, t<sub>r</sub>, t<sub>d(off)</sub>, t<sub>f</sub>



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

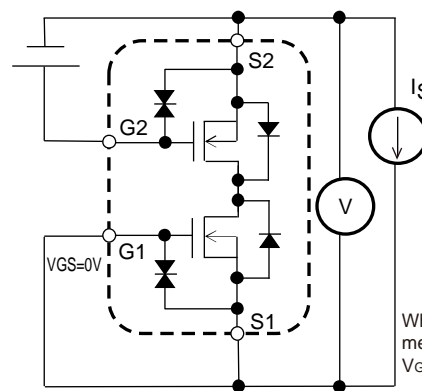
Test Circuit 7  
Q<sub>g</sub>



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

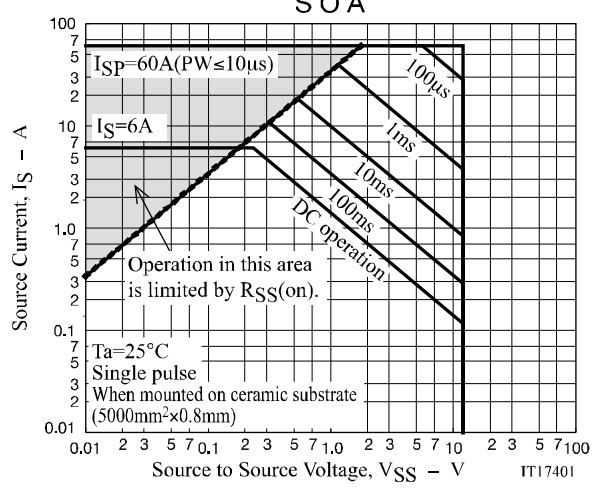
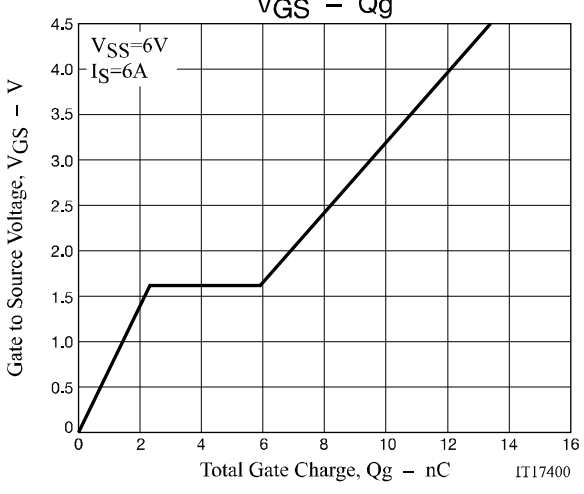
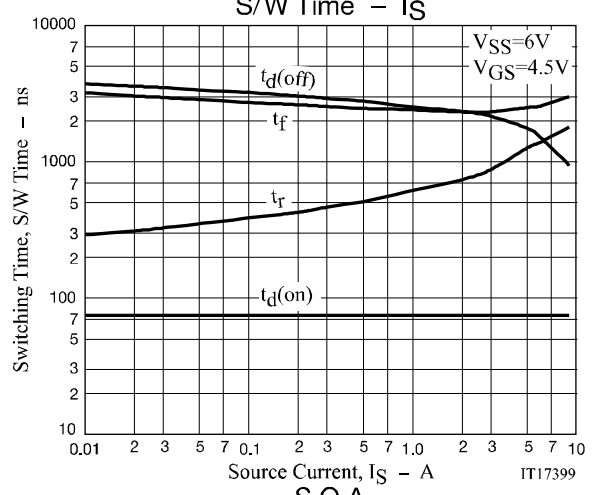
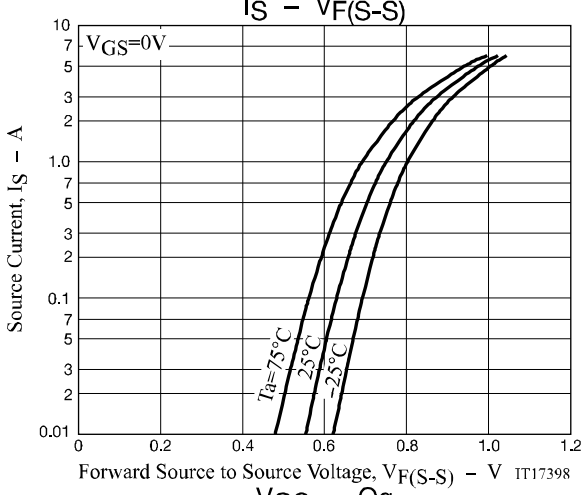
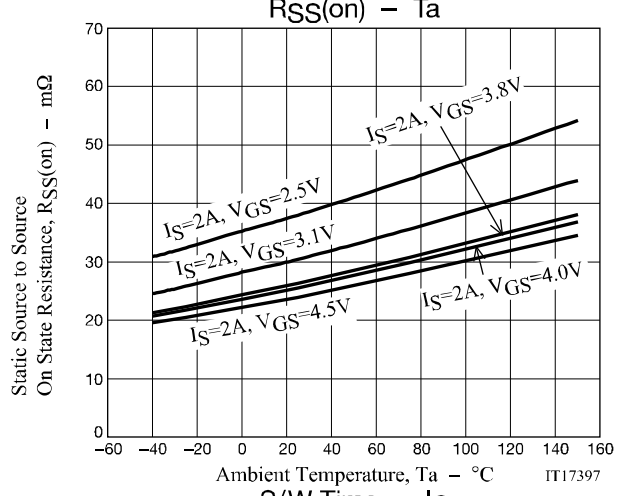
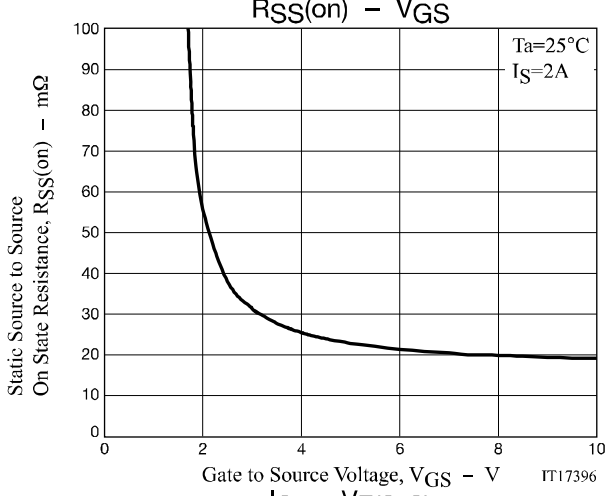
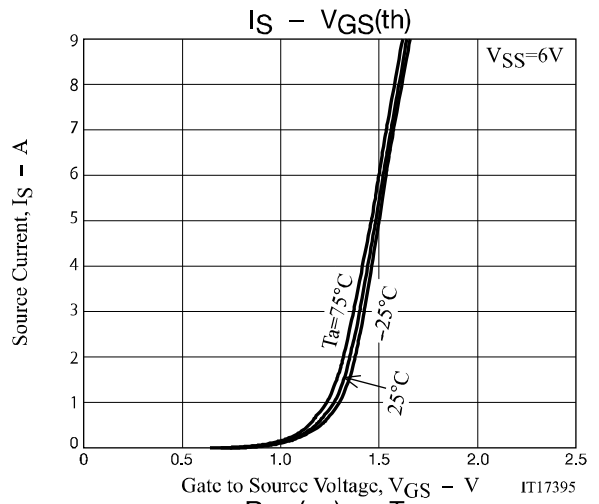
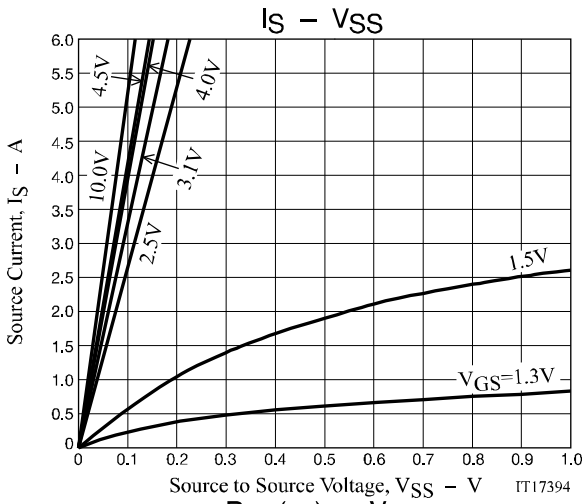
I<sub>G</sub> = 1mA

Test Circuit 8  
V<sub>F(S-S)</sub>

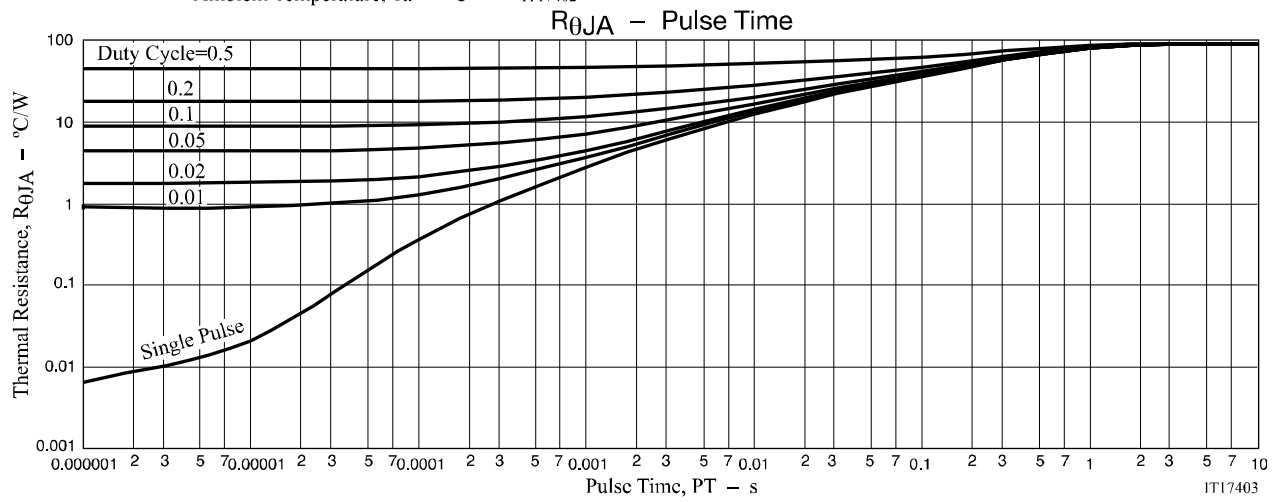
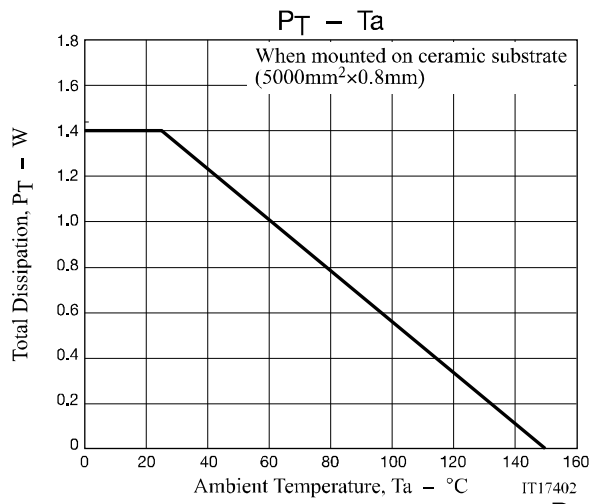


When FET1 is measured, +4.5V is added to V<sub>GS</sub> of FET2.

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



# EFC4627R



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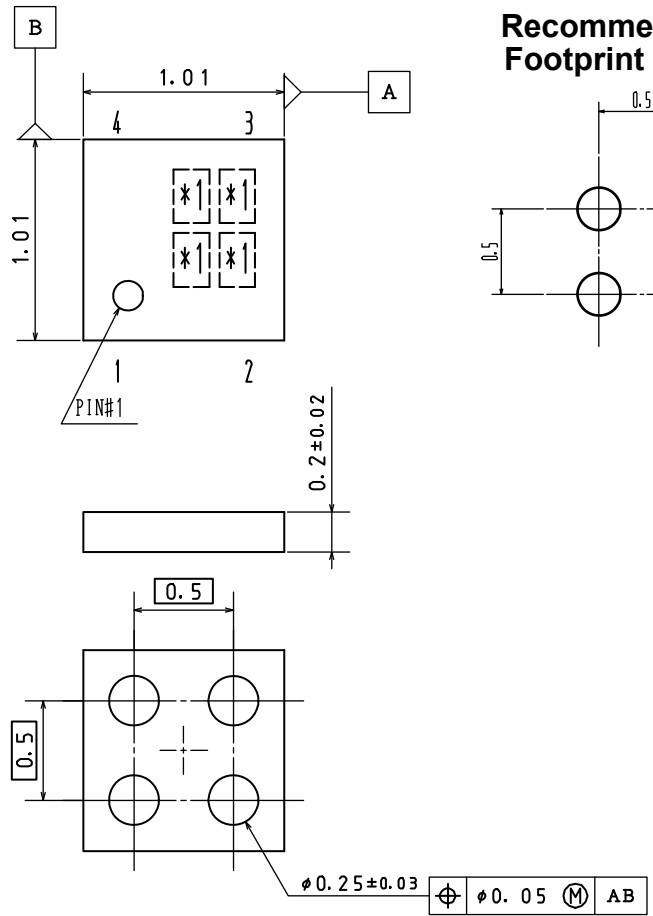
## Package Dimensions

EFC4627R-TR

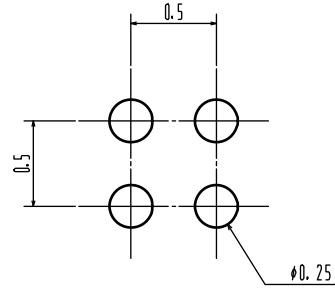
### EFCP1010-4DG-020

Unit : mm

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



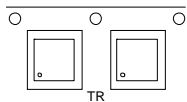
### Recommended Soldering Footprint



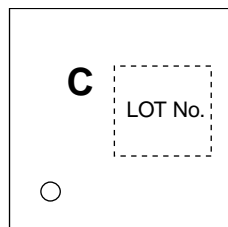
### Ordering & Package Information

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

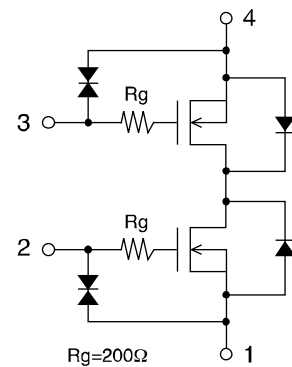
### Packing Type: TR



### 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.

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