



SANYO Semiconductors

## DATA SHEET

An ON Semiconductor Company

# EFC6602R — N-Channel Silicon MOSFET

## Lithium-ion battery charging and discharging switch

### Features

- 2.5V drive
- Common-drain type
- 2KV ESD HBM
- Protection diode in
- Halogen free compliance

### Specifications

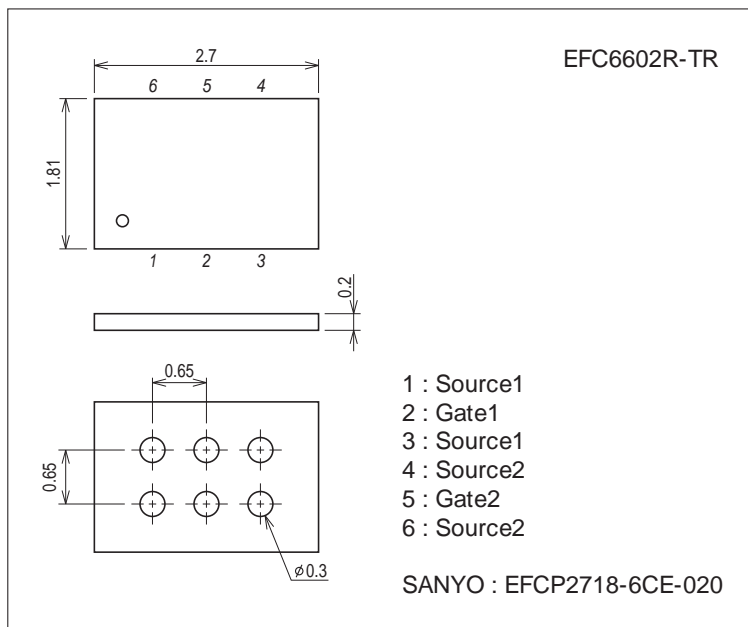
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Source-to-Source Voltage	V <sub>SSS</sub>		12	V
Gate-to-Source Voltage	V <sub>GSS</sub>		±12	V
Source Current (DC)	I <sub>S</sub>		18	A
Source Current (Pulse)	I <sub>SP</sub>	PW≤10μs, duty cycle≤1%	60	A
Total Dissipation	P <sub>T</sub>	When mounted on ceramic substrate (5000mm <sup>2</sup> ×0.8mm)	2.0	W
Channel Temperature	T <sub>ch</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

### Package Dimensions

unit : mm (typ)

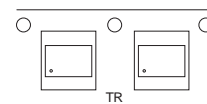
7073-001



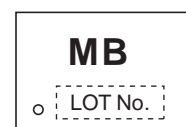
### Product & Package Information

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

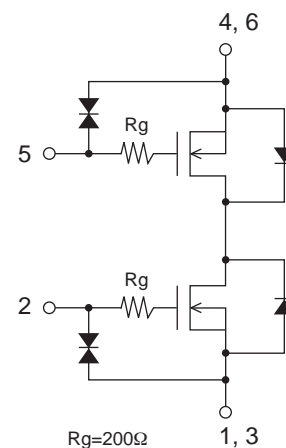
### Taping Type : TR



### Marking



### Electrical Connection



# EFC6602R

## Electrical Characteristics at Ta=25°C

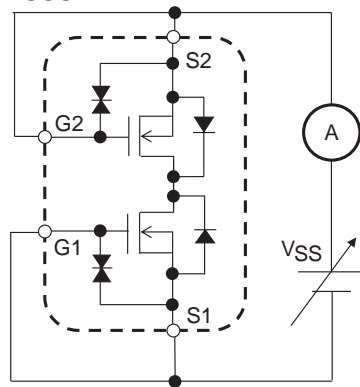
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Source-to-Source Breakdown Voltage	V(BR)SSS	IS=1mA, VGS=0V Test Circuit 1	12			V
Zero-Gate Voltage Source Current	ISSS	VSS=10V, VGS=0V Test Circuit 1			1	μA
Gate-to-Source Leakage Current	IGSS	VGS=±8V, VSS=0V Test Circuit 2			±1	μA
Cutoff Voltage	VGS(off)	VSS=6V, IS=1mA Test Circuit 3	0.5		1.3	V
Forward Transfer Admittance	yfs	VSS=6V, IS=3A Test Circuit 4		13		S
Static Source-to-Source On-State Resistance	RSS(on)1	IS=3A, VGS=4.5V Test Circuit 5	3.1	4.5	5.9	mΩ
	RSS(on)2	IS=3A, VGS=4.0V Test Circuit 5	3.3	4.8	6.3	mΩ
	RSS(on)3	IS=3A, VGS=3.8V Test Circuit 5	3.5	5	6.5	mΩ
	RSS(on)4	IS=3A, VGS=3.1V Test Circuit 5	4.0	5.8	8.2	mΩ
	RSS(on)5	IS=3A, VGS=2.5V Test Circuit 5	5.2	7.5	11	mΩ
Turn-ON Delay Time	td(on)	VDD=6V, VGS=4.5V, IS=3A Test Circuit 7		530		ns
Rise Time	tr			2100		ns
Turn-OFF Delay Time	td(off)			6200		ns
Fall Time	tf			5500		ns
Total Gate Charge	Qg	VDD=6V, VGS=4.5V, IS=18A Test Circuit 8		55		nC
Forward Source-to-Source Voltage	VF(S-S)	IS=3A, VGS=0V Test Circuit 6		0.76	1.2	V

## Ordering Information

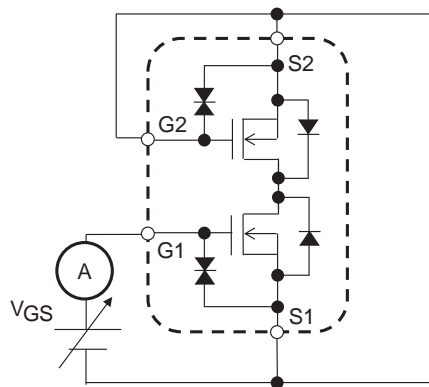
Device	Package	Shipping	memo
EFC6602R-TR	EFCP	5,000pcs./reel	Pb Free and Halogen Free

Test circuits are example of measuring FET1 side

Test Circuit 1  
 $I_{SSS}$

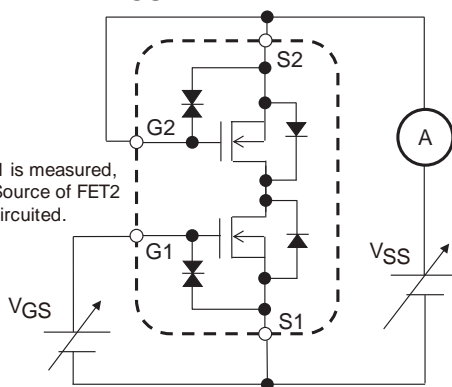


Test Circuit 2  
 $I_{GSS}$



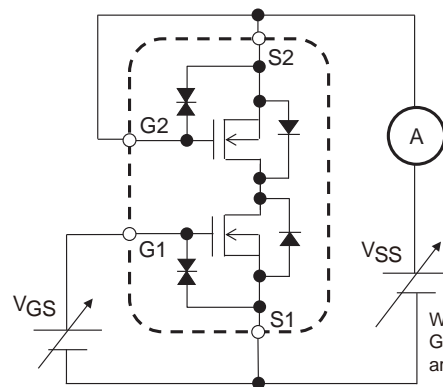
When FET1 is measured, Gate and Source of FET2 are short-circuited.

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



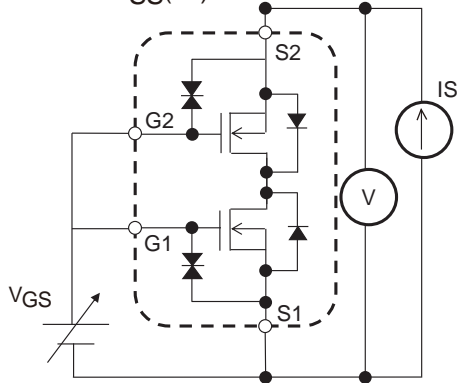
When FET1 is measured, Gate and Source of FET2 are short-circuited.

Test Circuit 4  
 $|y_{fs}|$

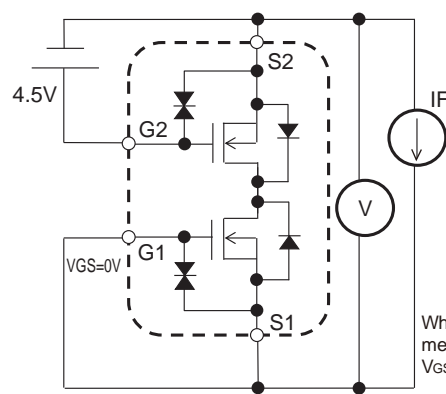


When FET1 is measured, Gate and Source of FET2 are short-circuited.

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

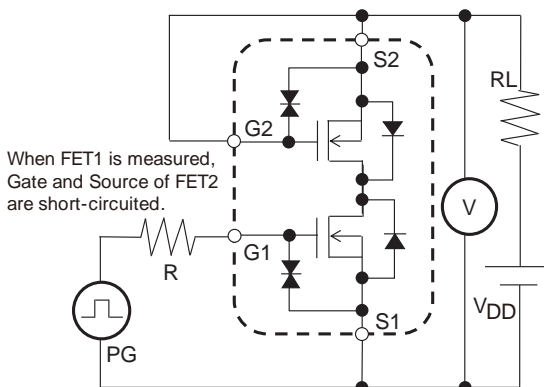


Test Circuit 6  
 $V_{F(S-S)}$



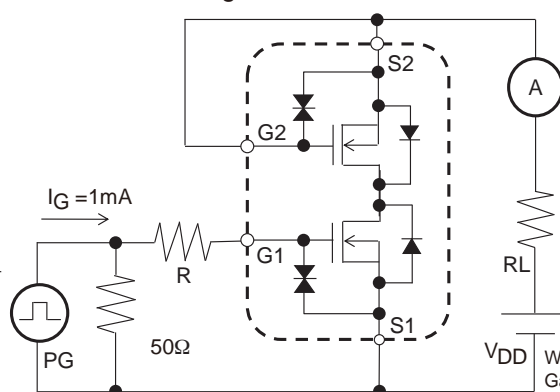
When FET1 is measured, +4.5V is added to  $V_{GS}$  of FET2.

Test Circuit 7  
 $t_d(on)$ ,  $t_r$ ,  $t_d(off)$ ,  $t_f$

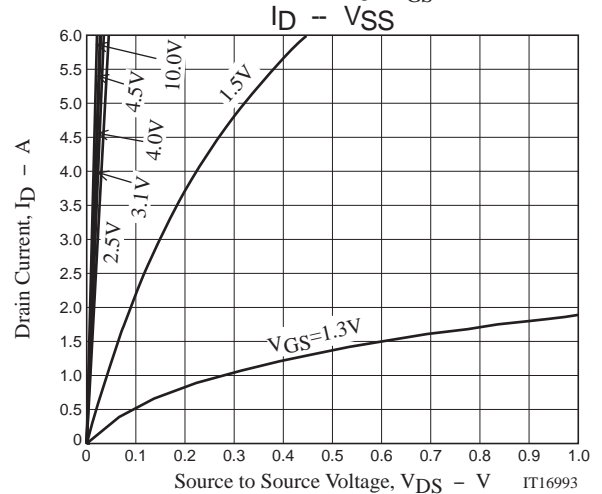
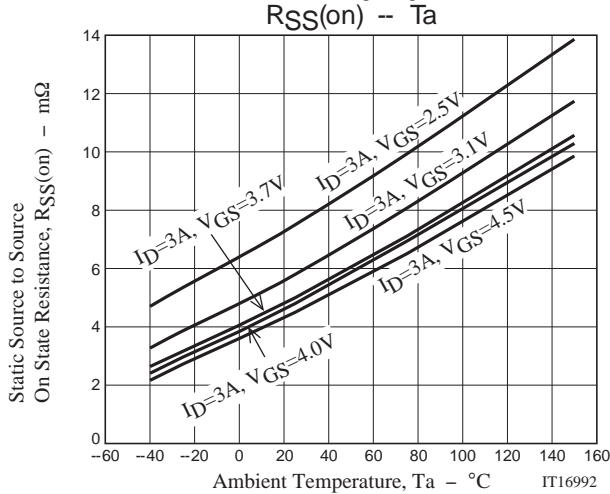
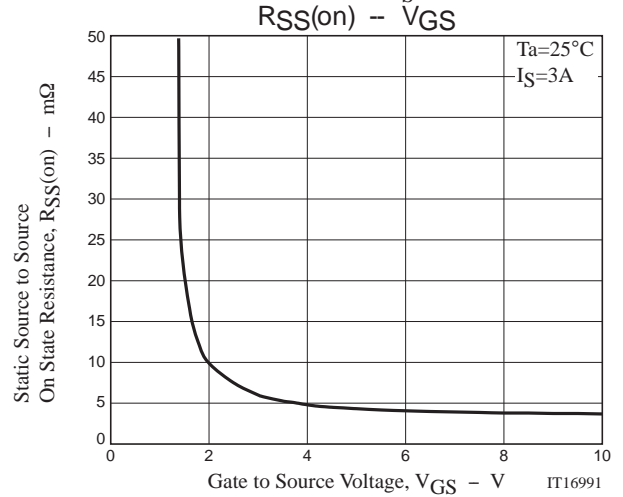
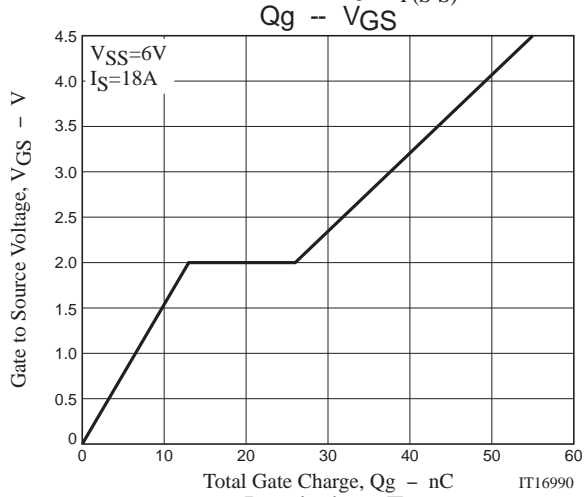
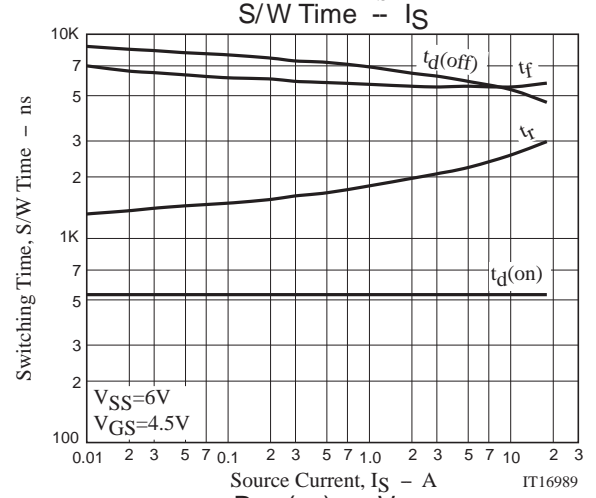
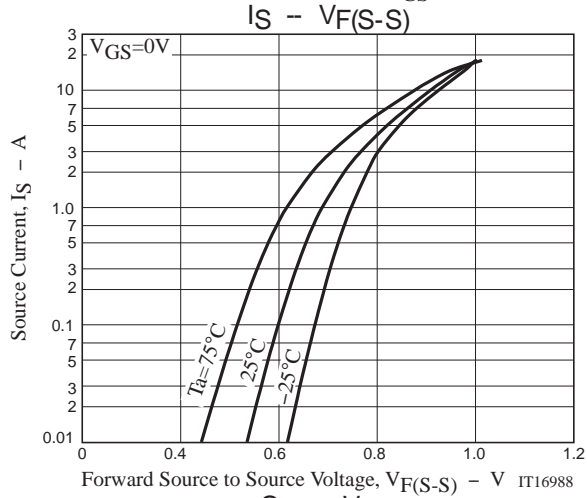
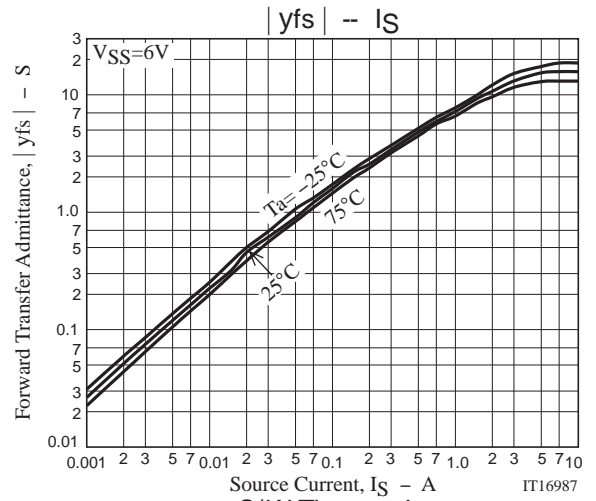
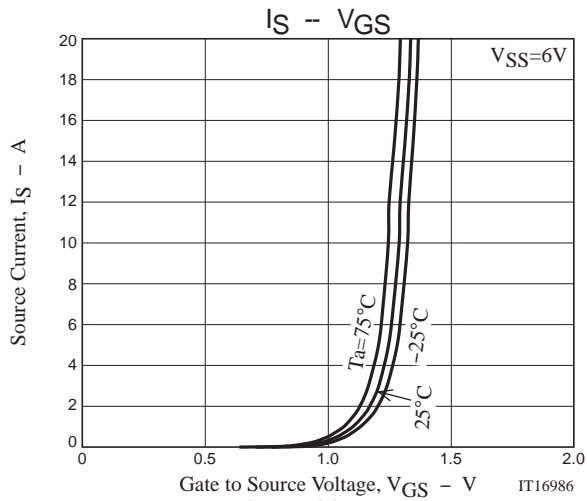


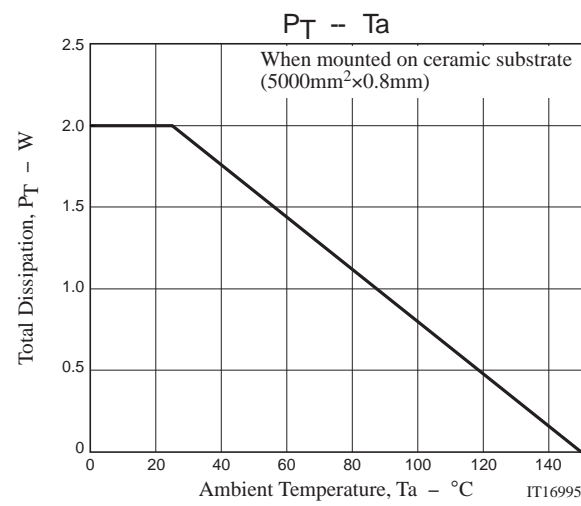
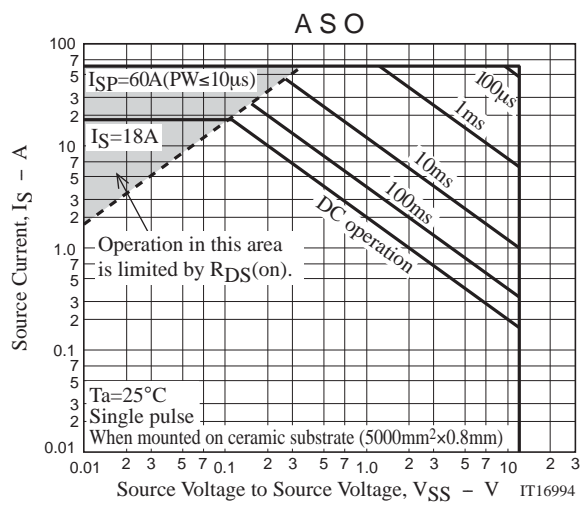
When FET1 is measured, Gate and Source of FET2 are short-circuited.

Test Circuit 8  
 $Q_g$



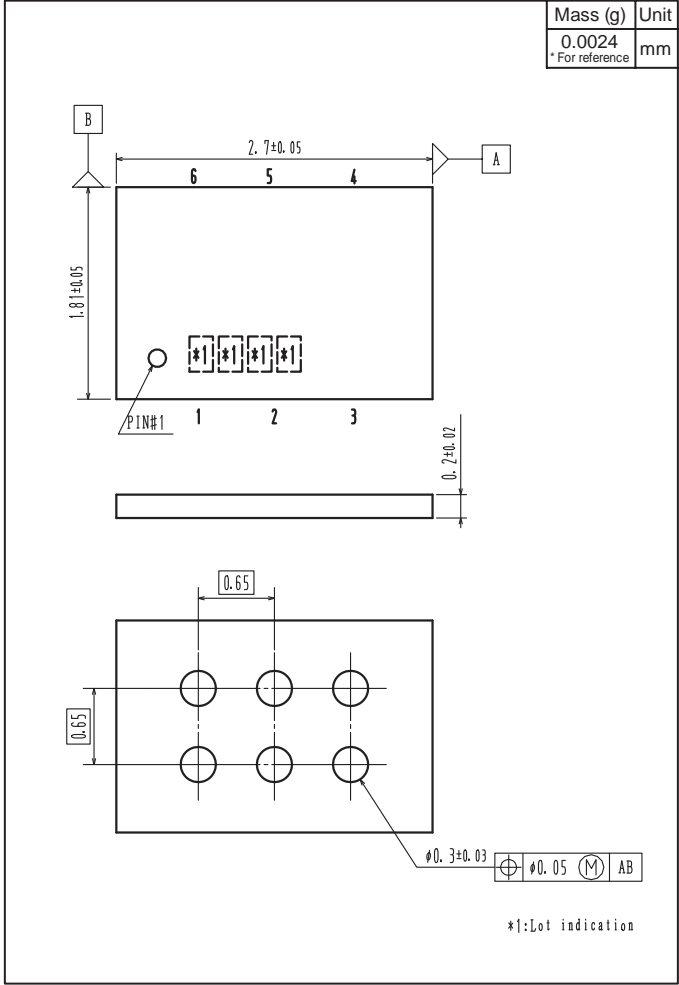
When FET1 is measured, Gate and Source of FET2 are short-circuited.



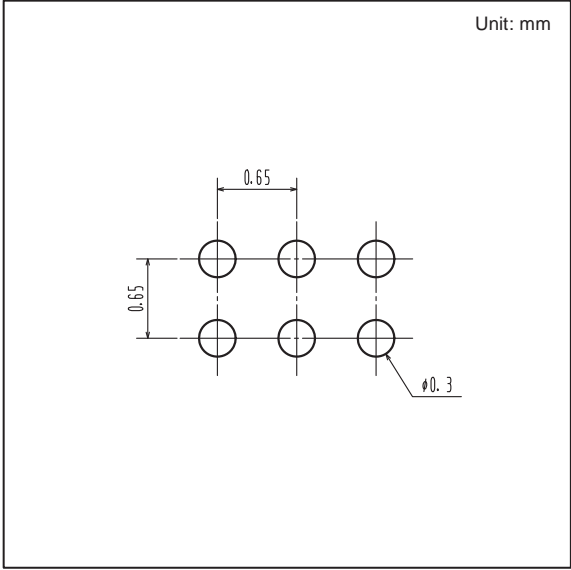




Outline Drawing  
EFC6602R-TR



Land Pattern Example



Note on usage : Since the EFC6602R is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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