



SANYO Semiconductors

DATA SHEET

N-Channel Silicon MOSFET

EFC4601R — General-Purpose Switching Device Applications

Features

- 2.5V drive.
- Best suited for LiB charging and discharging switch.
- Common-drain type.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Source-to-Source Voltage	V _{SS}		24	V
Gate-to-Source Voltage	V _{GS}		±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
Channel Temperature	T _{ch}		150	°C
Storage Temperature	T _{stg}		-55 to +150	°C

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			±10	μA
Cutoff Voltage	V _{GS(off)}	V _{SS} =10V, I _S =1mA Test Circuit 3	0.5		1.3	V
Forward Transfer Admittance	y _{fs}	V _{SS} =10V, I _S =3A Test Circuit 4	3.7	6.2		S
Static Source-to-Source On-State Resistance	R _{SS(on)1}	I _S =3A, V _{GS} =4.5V Test Circuit 5	23.5	34	44	mΩ
	R _{SS(on)2}	I _S =3A, V _{GS} =4.0V Test Circuit 5	25	36	47	mΩ
	R _{SS(on)3}	I _S =3A, V _{GS} =3.7V Test Circuit 5	27	38	49	mΩ
	R _{SS(on)4}	I _S =3A, V _{GS} =3.1V Test Circuit 5	27	42	55	mΩ
	R _{SS(on)5}	I _S =3A, V _{GS} =2.5V Test Circuit 5	30	50	70	mΩ

Marking : FC

Continued on next page.

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EFC4601R

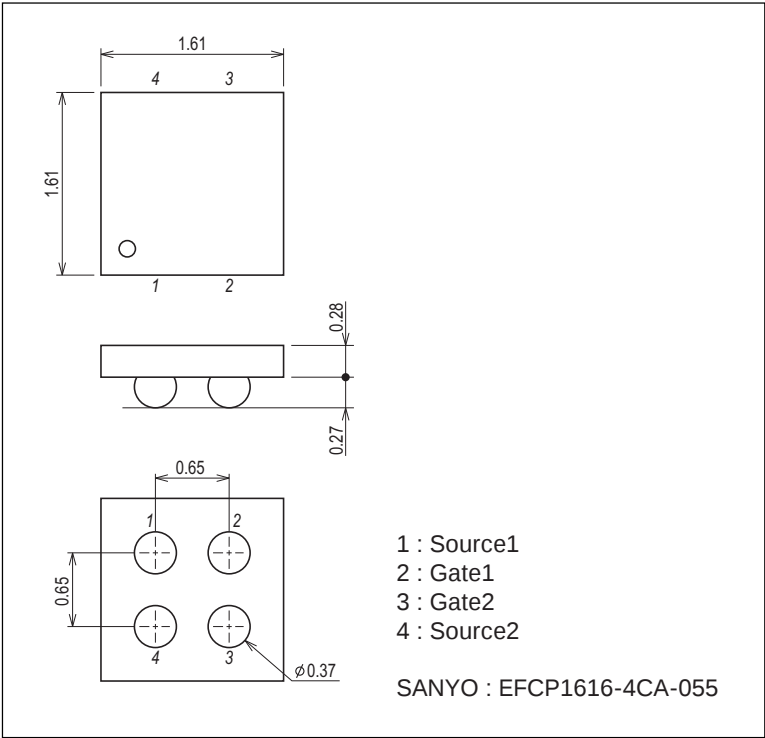
Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	VSS=10V, f=1MHz Test Circuit 8		680		pF
Output Capacitance	Coss	VSS=10V, f=1MHz Test Circuit 8		125		pF
Reverse Transfer Capacitance	Crss	VSS=10V, f=1MHz Test Circuit 8		42		pF
Turn-ON Delay Time	td(on)	See specified Test Circuit. Test Circuit 7		28		ns
Rise Time	tr	See specified Test Circuit. Test Circuit 7		105		ns
Turn-OFF Delay Time	td(off)	See specified Test Circuit. Test Circuit 7		220		ns
Fall Time	tf	See specified Test Circuit. Test Circuit 7		190		ns
Total Gate Charge	Qg	VSS=10V, VGS=4.5V, IS=6A		9.3		nC
Forward Source-to-Source Voltage	VF(S-S)	IS=6A, VGS=0V Test Circuit 6		1	1.2	V

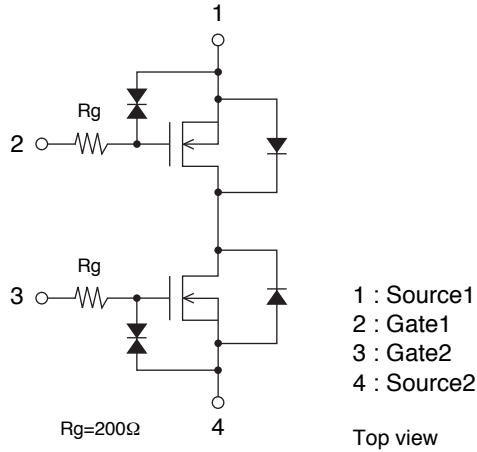
Package Dimensions

unit : mm (typ)

7058-001

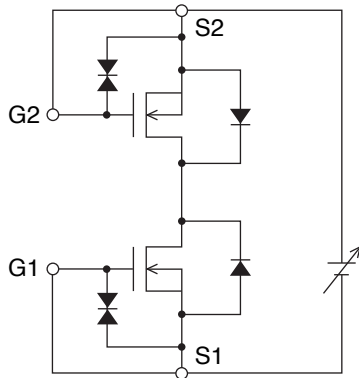


Electrical Connection



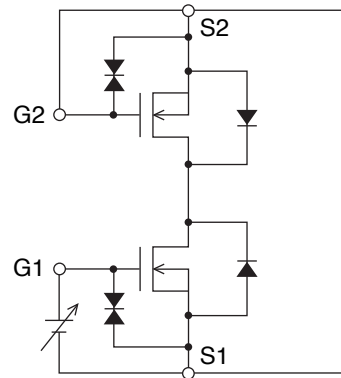
Test Circuits are example of measuring FET1 side

Test Circuit 1
 V_{SSS} / I_{SSS}



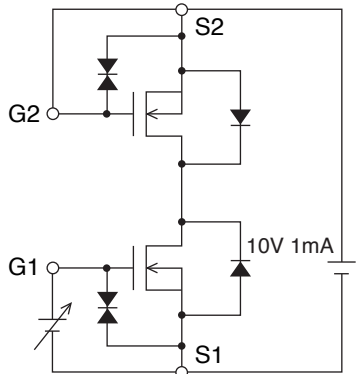
IT11565

Test Circuit 2
 $I_{GSS} (+) / (-)$



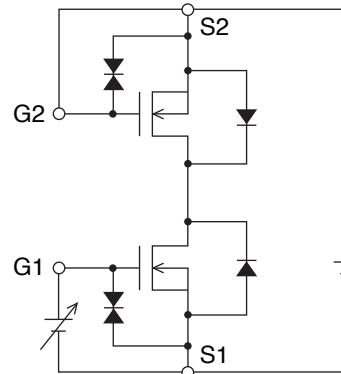
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Test Circuit 3
 $V_{GS} \text{ (off)}$



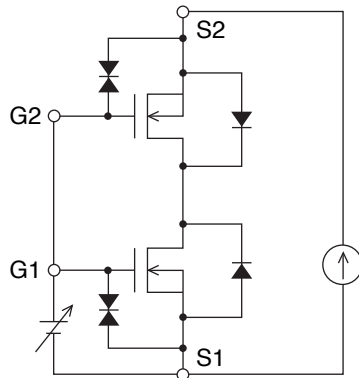
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Test Circuit 4
 $|y_{fs}|$



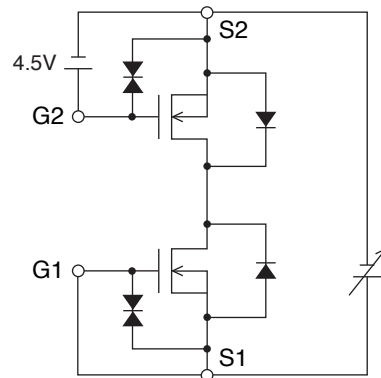
IT11568

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



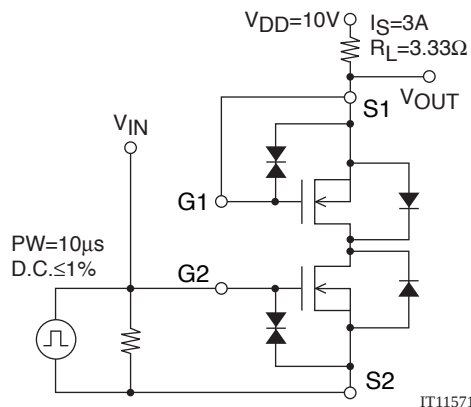
IT11569

Test Circuit 6
 $V_F \text{ (S-S)}$



IT11570

Test Circuit 7
 $t_d \text{ (on)}, t_r, t_d \text{ (off)}, t_f$

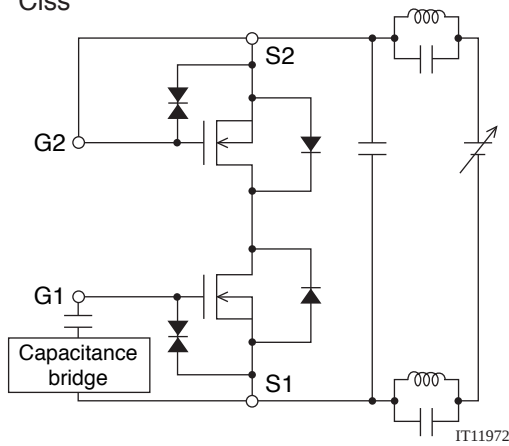


IT11571

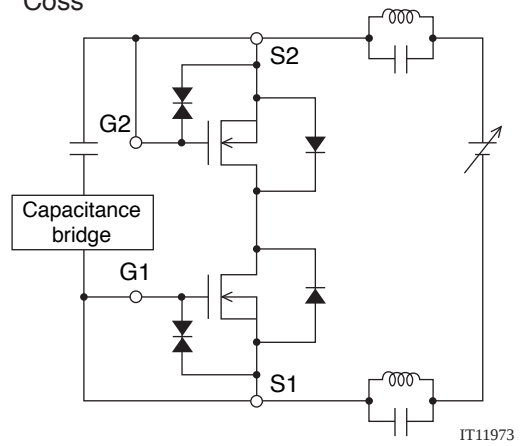
* Note: Connect the measurement terminal reversely if you want to measure the FET2 side.

Test Circuit 8

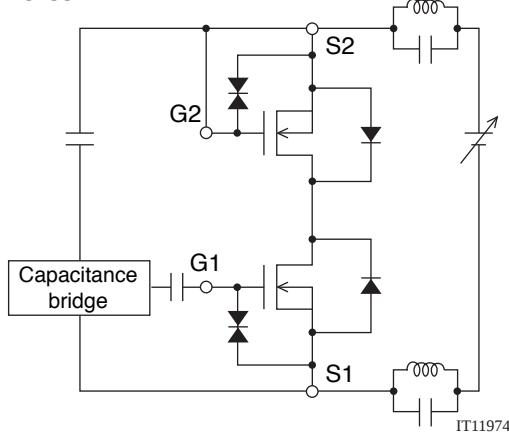
Ciss



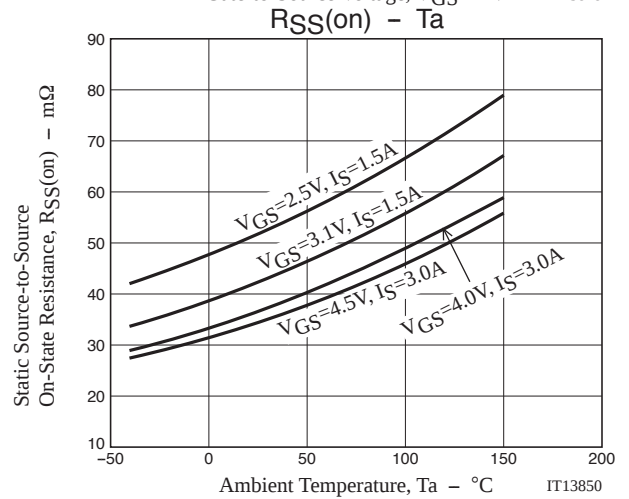
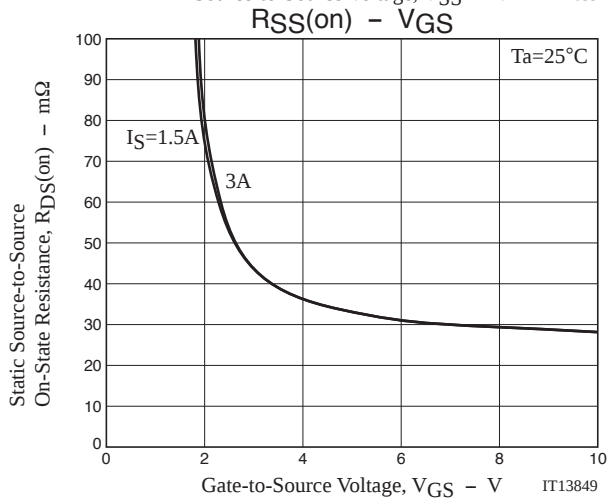
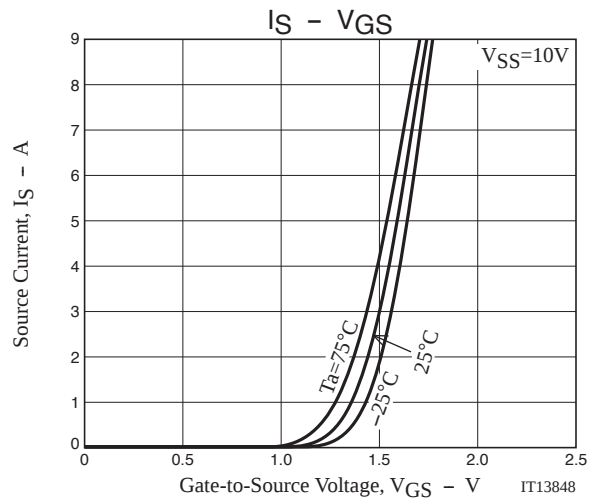
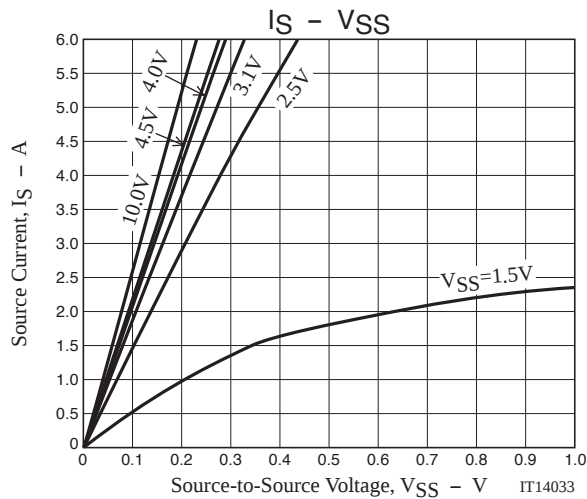
Coss

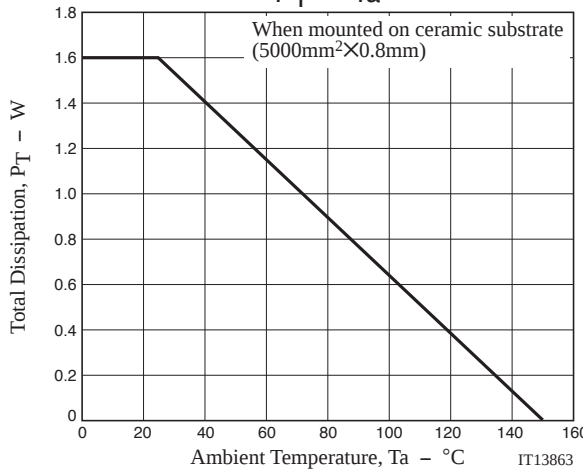
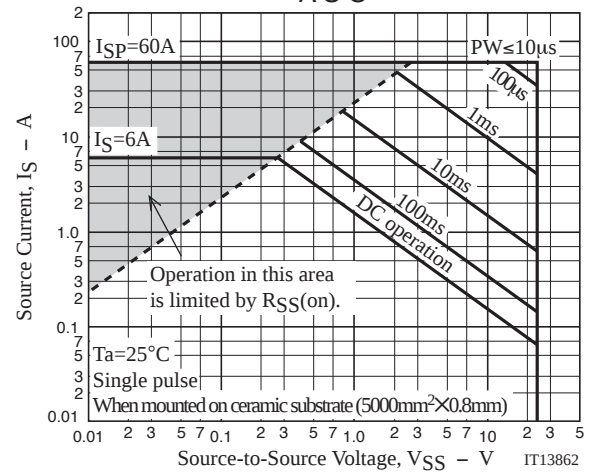
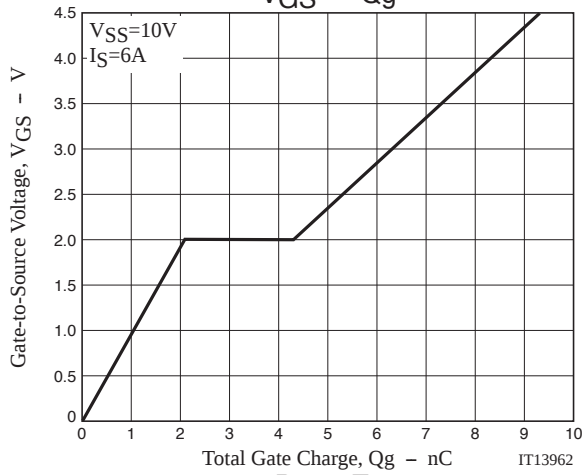
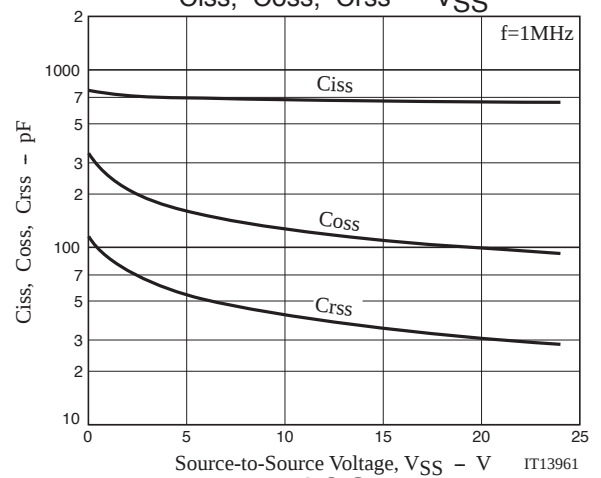
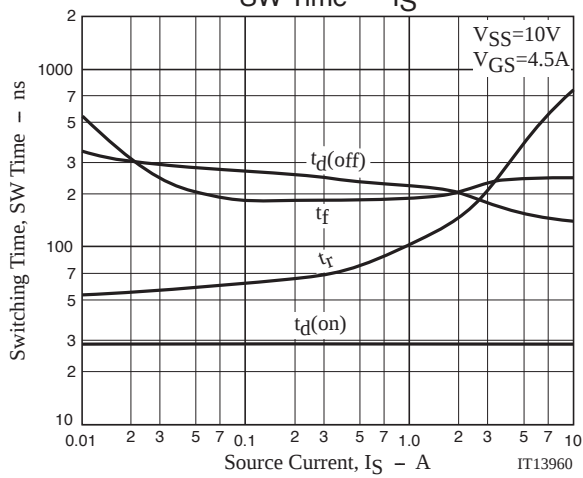
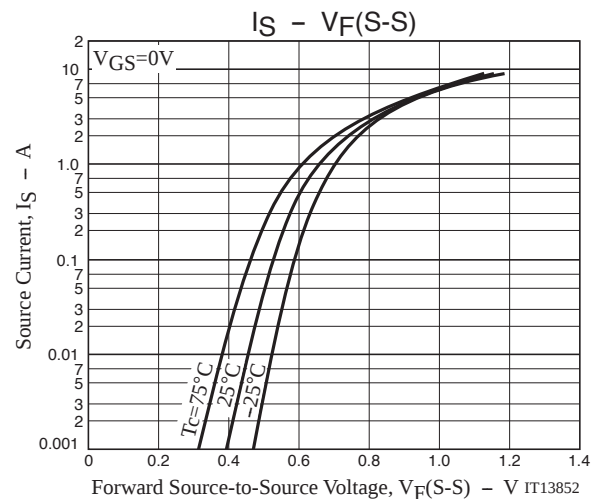
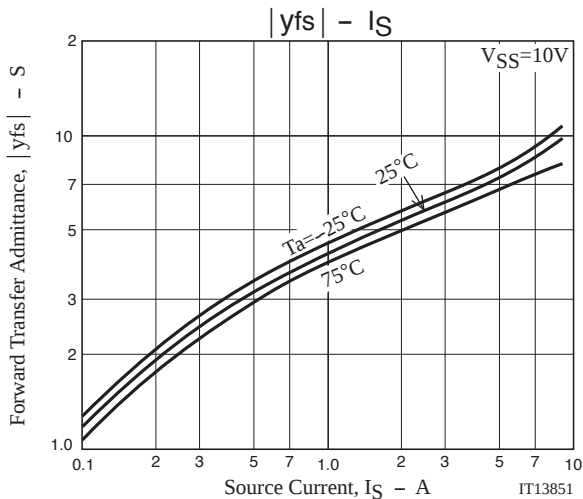


Crss



* Note: Connect the measurement terminal reversely if you want to measure the FET2 side.





Note on usage : Since the EFC4601R is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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