



ON Semiconductor®

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DATA SHEET

N-Channel Silicon MOSFET

EFC4612R — **General-Purpose Switching Device**
Applications**Features**

- 2.5V drive.
- Built-in gate protection resistor.
- 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 _{SSS}		24	V
Gate-to-Source Voltage	V _{GSS}		±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 (5000mm ² ×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		3.1		S

Marking : FN

Continued on next page.

EFC4612R

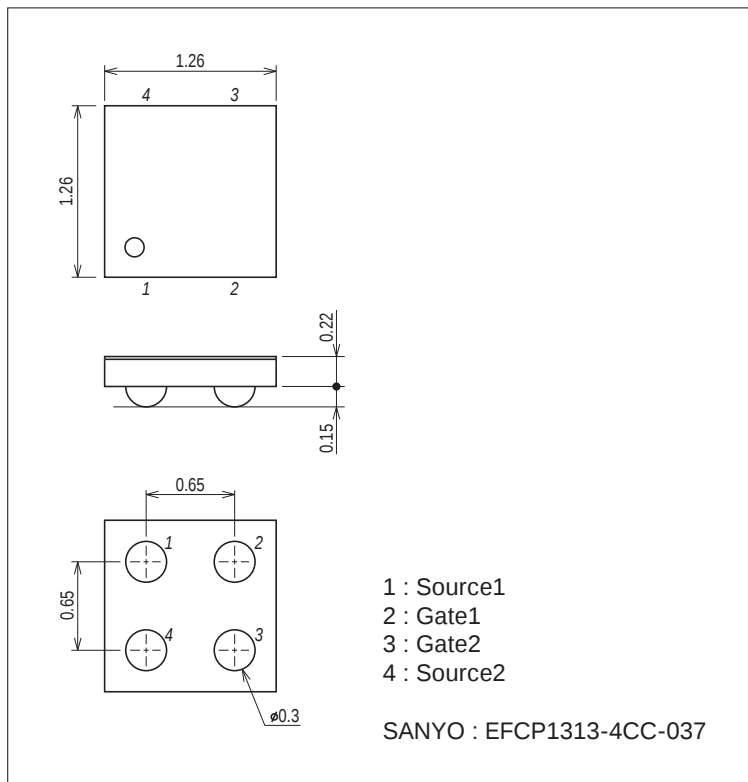
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Static Source-to-Source On-State Resistance	$R_{SS(on)1}$	$I_S=3A, V_{GS}=4.5V$ Test Circuit 5	24	39	45	$m\Omega$
	$R_{SS(on)2}$	$I_S=3A, V_{GS}=4.0V$ Test Circuit 5	25	41	48	$m\Omega$
	$R_{SS(on)3}$	$I_S=3A, V_{GS}=3.7V$ Test Circuit 5	27.5	43	50	$m\Omega$
	$R_{SS(on)4}$	$I_S=3A, V_{GS}=3.1V$ Test Circuit 5	31.5	48	57	$m\Omega$
	$R_{SS(on)5}$	$I_S=3A, V_{GS}=2.5V$ Test Circuit 5	33.5	58	72	$m\Omega$
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit. Test Circuit 7		20		ns
Rise Time	t_r	See specified Test Circuit. Test Circuit 7		230		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit. Test Circuit 7		130		ns
Fall Time	t_f	See specified Test Circuit. Test Circuit 7		210		ns
Total Gate Charge	Q_g	$V_{SS}=10V, V_{GS}=4.5V, I_S=6A$		7		nC
Forward Source-to-Source Voltage	$V_{F(S-S)}$	$I_S=3A, V_{GS}=0V$ Test Circuit 6		0.8	1.2	V

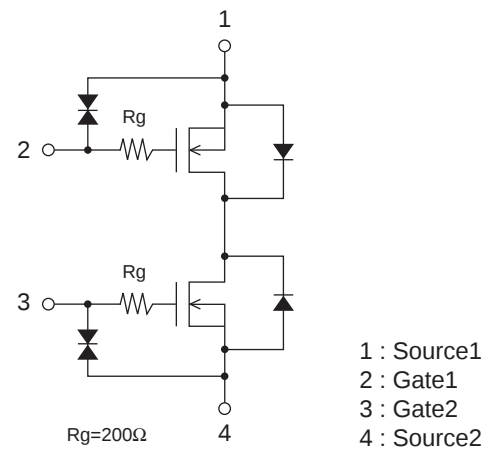
Package Dimensions

unit : mm (typ)

7064-001



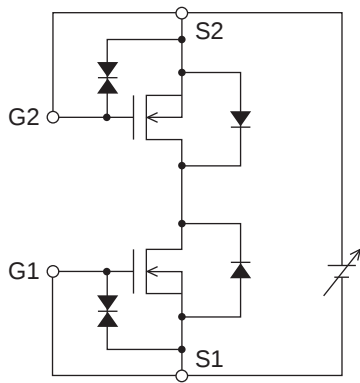
Electrical Connection



Test circuits are example of measuring FET1 side

Test Circuit 1

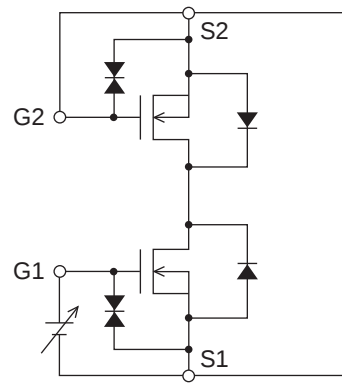
V_{SSS} / I_{SSS}



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Test Circuit 2

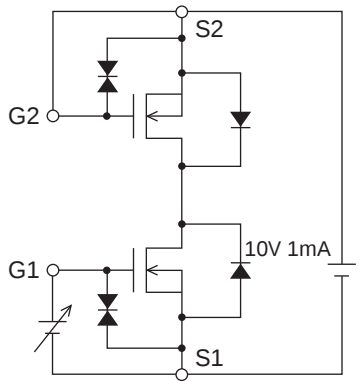
$I_{GSS}(+) / (-)$



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Test Circuit 3

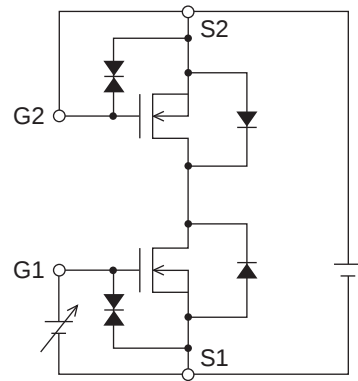
$V_{GS(off)}$



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Test Circuit 4

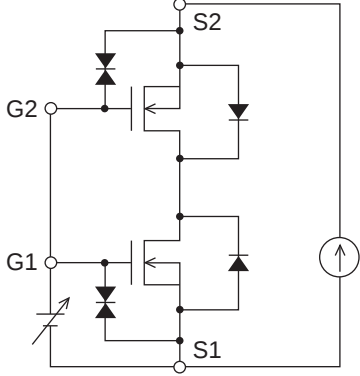
$|y_{fs}|$



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Test Circuit 5

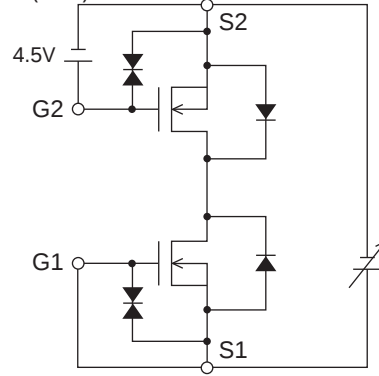
$R_{SS(on)}$



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Test Circuit 6

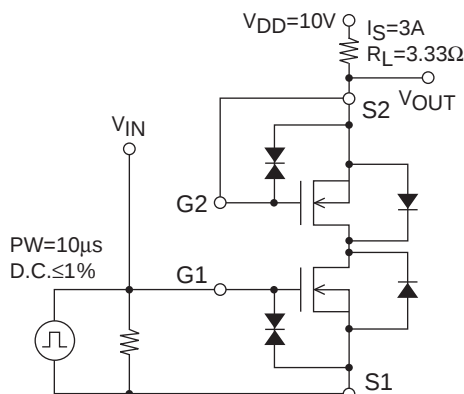
$V_{F(S-S)}$



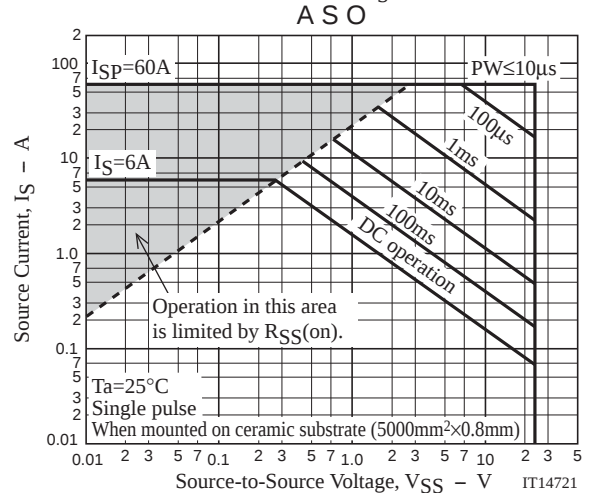
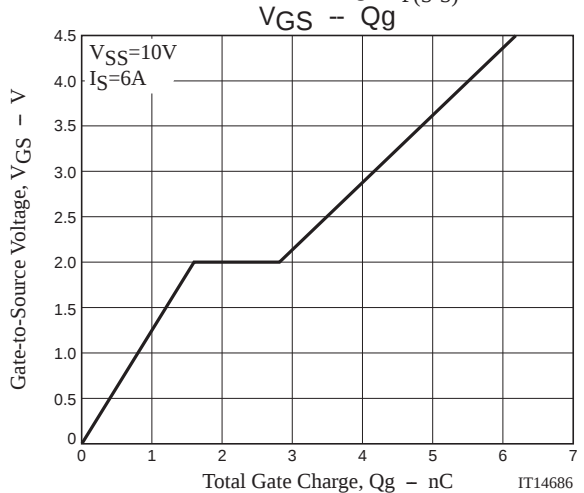
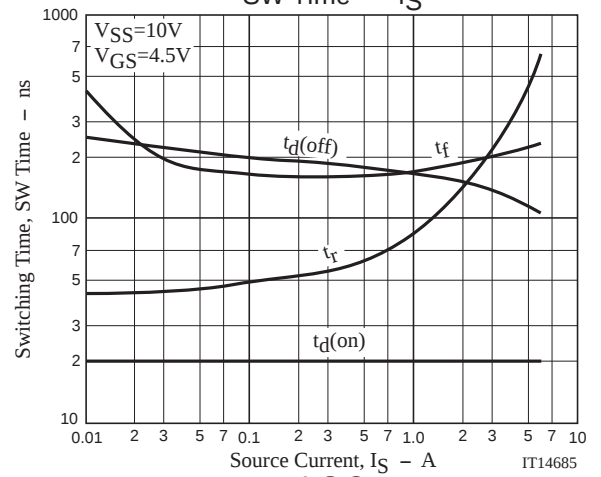
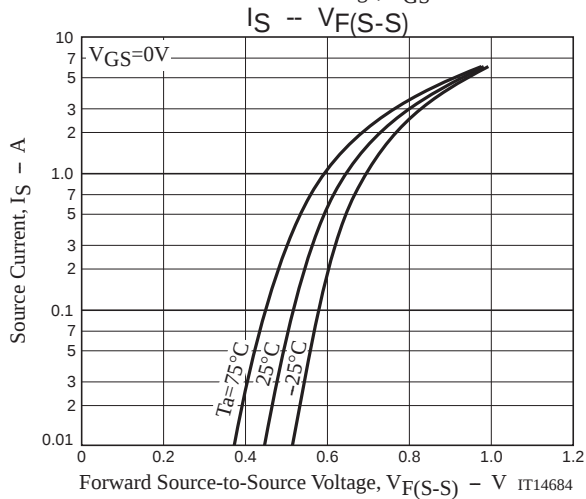
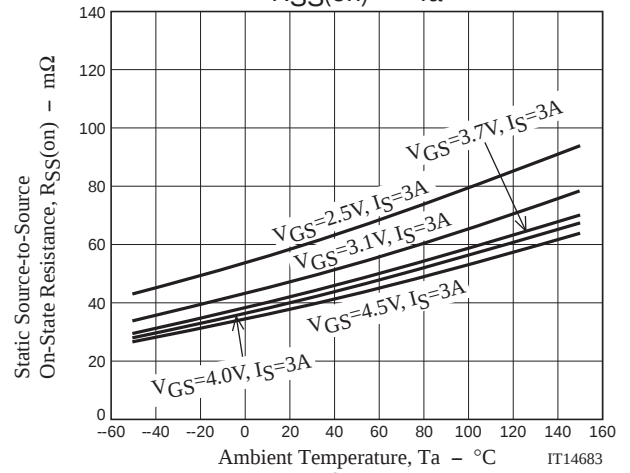
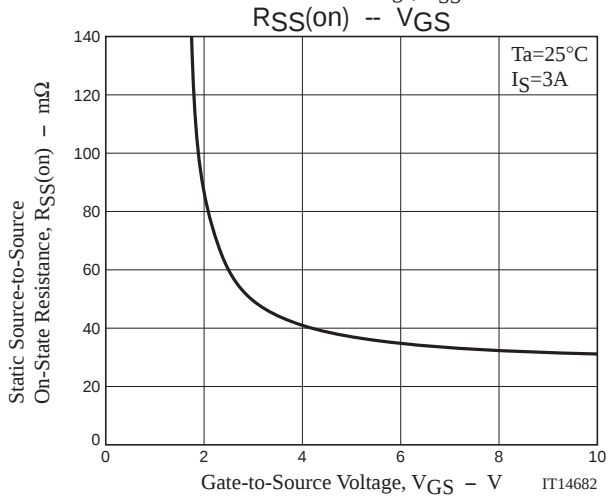
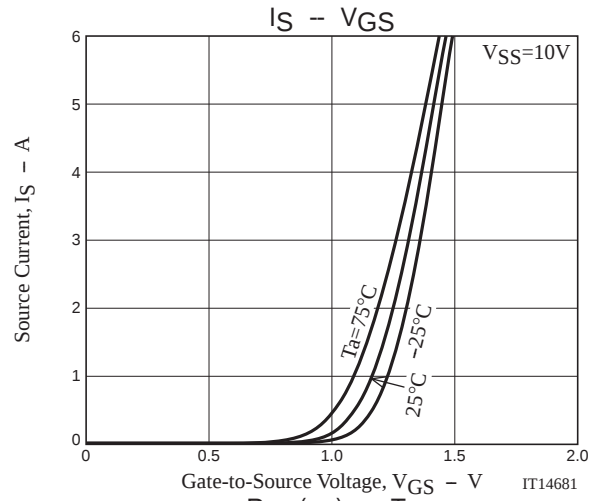
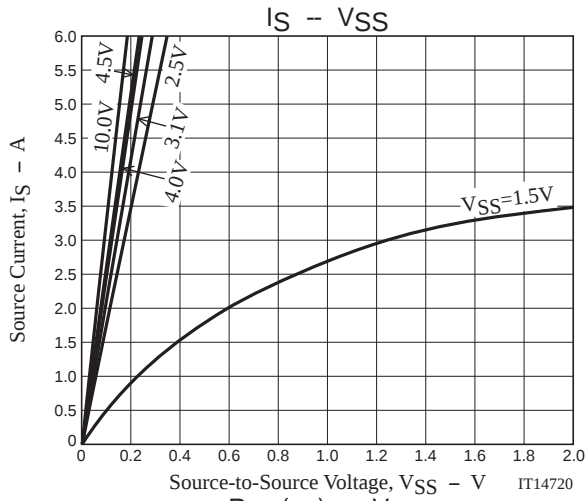
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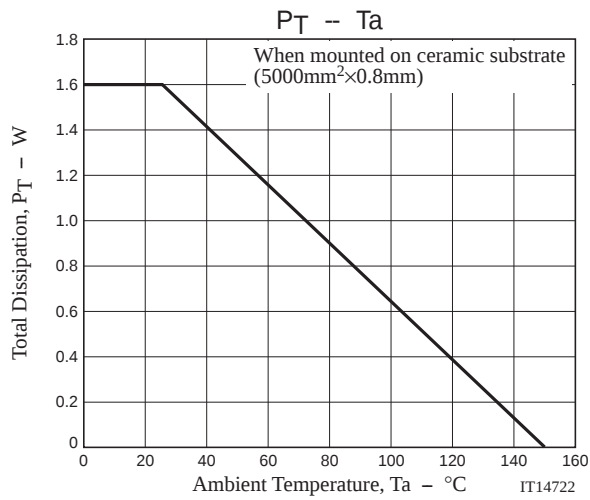
Test Circuit 7

$t_d(on)$, t_r , $t_d(off)$, t_f



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





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