



SANYO Semiconductors

DATA SHEET

EFC4602 — N-Channel Silicon MOSFET

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} | | 20 | V |
| Gate-to-Source Voltage | V _{GS} | | ±12 | V |
| Source Current (DC) | I _S | | 6 | A |
| Source Current (Pulse) | I _{SP} | PW≤100μs, 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 | 20 | | 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 | 4.5 | 7.5 | S | |
| Static Source-to-Source On-State Resistance | R _{SS(on)1} | I _S =3A, V _{GS} =4.5V | Test Circuit 5 | 19.5 | 28 | 36.5 | mΩ |
| | R _{SS(on)2} | I _S =3A, V _{GS} =4.0V | Test Circuit 5 | 20 | 29 | 38 | mΩ |
| | R _{SS(on)3} | I _S =1.5A, V _{GS} =3.1V | Test Circuit 5 | 23 | 33 | 43 | mΩ |
| | R _{SS(on)4} | I _S =1.5A, V _{GS} =2.5V | Test Circuit 5 | 23 | 38 | 53.5 | mΩ |

Marking : FB

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EFC4602

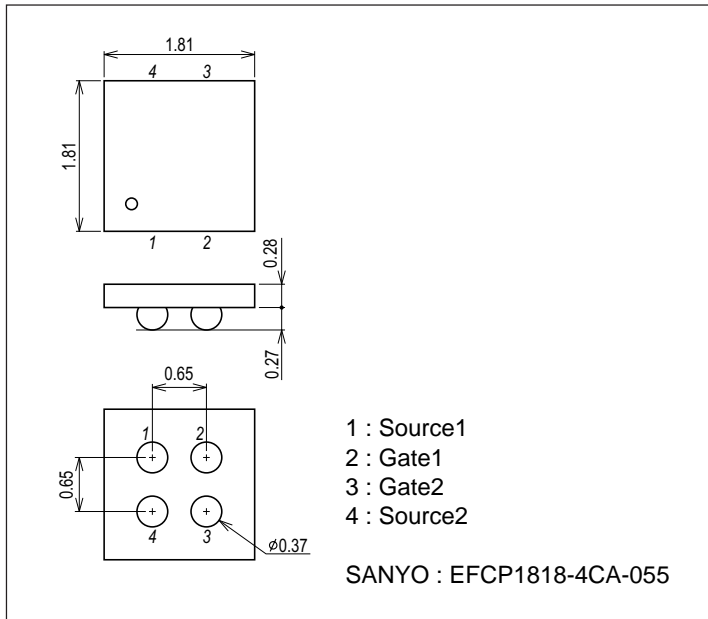
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| Parameter | Symbol | Conditions | Ratings | | | Unit |
|----------------------------------|---------------------|----------------------------------------------------------------|---------|------|-----|------|
| | | | min | typ | max | |
| Input Capacitance | Ciss | V _{SS} =10V, f=1MHz Test Circuit 8 | | 1000 | | pF |
| Output Capacitance | Coss | V _{SS} =10V, f=1MHz Test Circuit 8 | | 180 | | pF |
| Reverse Transfer Capacitance | Crss | V _{SS} =10V, f=1MHz Test Circuit 8 | | 140 | | pF |
| Turn-ON Delay Time | t _{d(on)} | See specified Test Circuit. Test Circuit 7 | | 23 | | ns |
| Rise Time | t _r | See specified Test Circuit. Test Circuit 7 | | 185 | | ns |
| Turn-OFF Delay Time | t _{d(off)} | See specified Test Circuit. Test Circuit 7 | | 160 | | ns |
| Fall Time | t _f | See specified Test Circuit. Test Circuit 7 | | 200 | | ns |
| Total Gate Charge | Qg | V _{SS} =10V, V _{GS} =10V, I _S =6A | | 13 | | nC |
| Forward Source-to-Source Voltage | V _{F(S-S)} | I _S =6A, V _{GS} =0V Test Circuit 6 | | 0.78 | 1.2 | V |

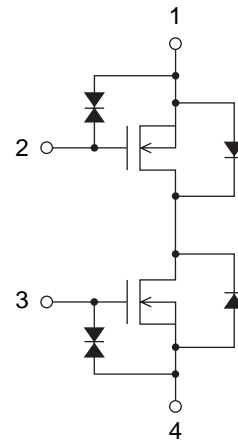
Package Dimensions

unit : mm (typ)

7056-001

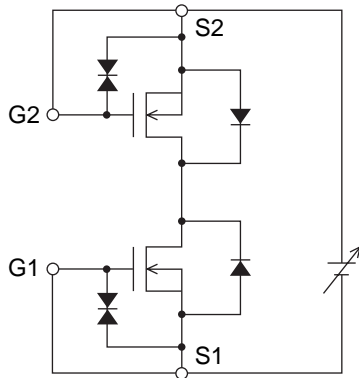


Electrical Connection



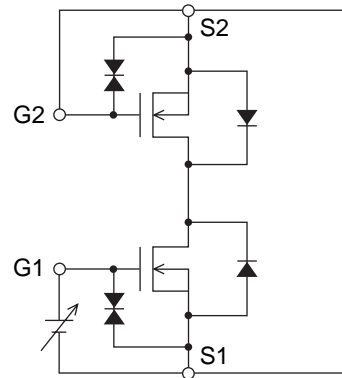
Test Circuits are example of measuring FET1 side

Test Circuit 1
VSSS / ISSS



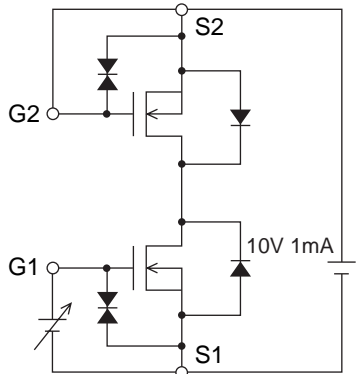
IT11565

Test Circuit 2
IGSS (+) / (-)



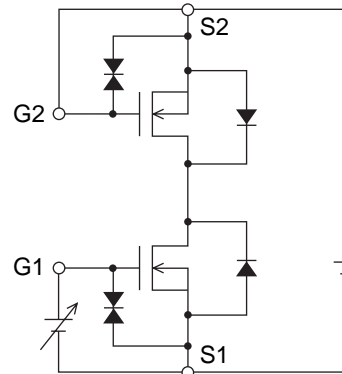
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Test Circuit 3
VGS (off)



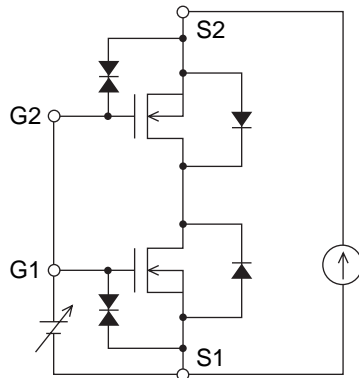
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Test Circuit 4
|yfs| □



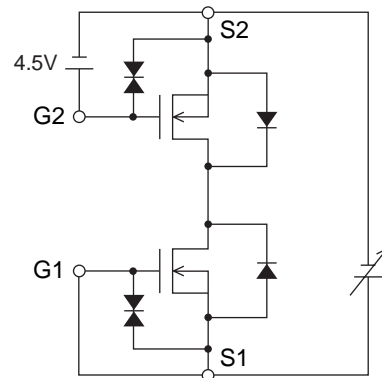
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Test Circuit 5
RSS (on)



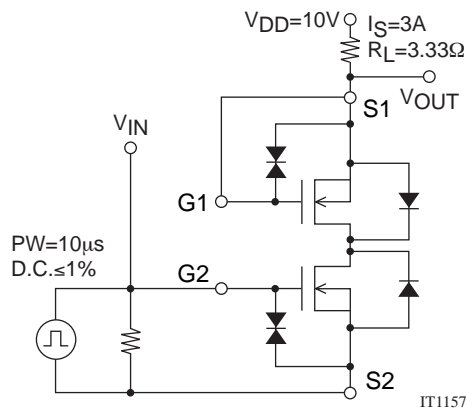
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Test Circuit 6
VF (S-S)



IT11570

Test Circuit 7
td (on), tr, td (off), tf

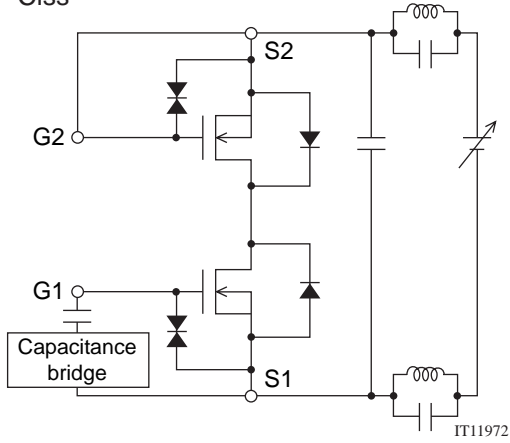


IT11571

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

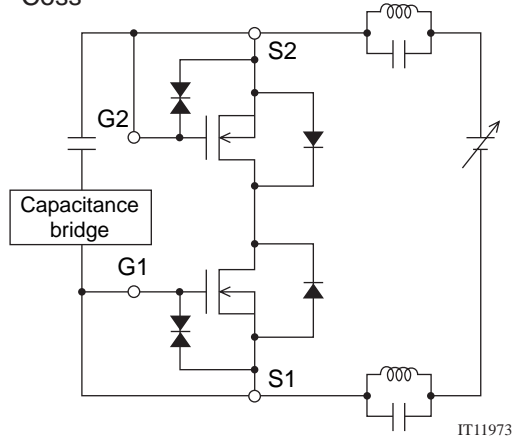
Test Circuit 8

Ciss



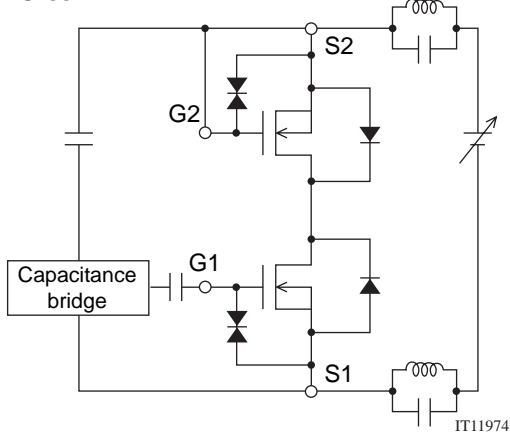
IT11972

Coss



IT11973

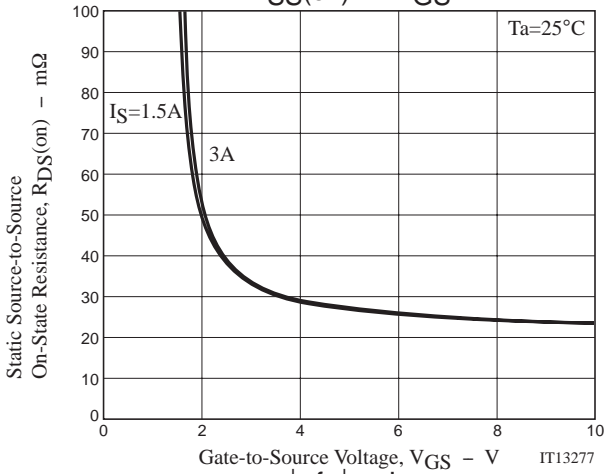
Crss



IT11974

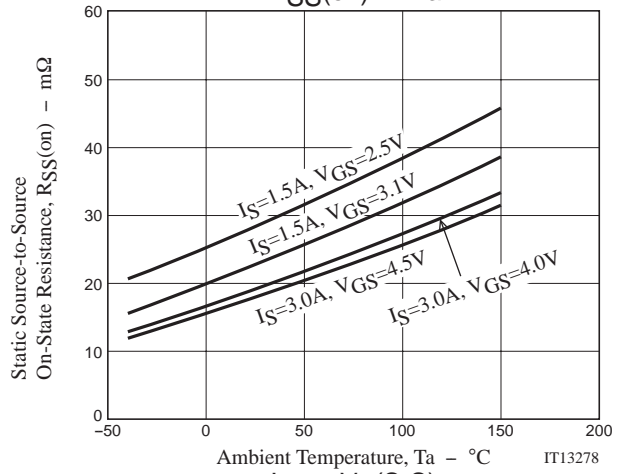
* Note: Connect the measurement terminal reversely if you want to measure the FET2 side.

R_{SS(on)} - V_{GS}



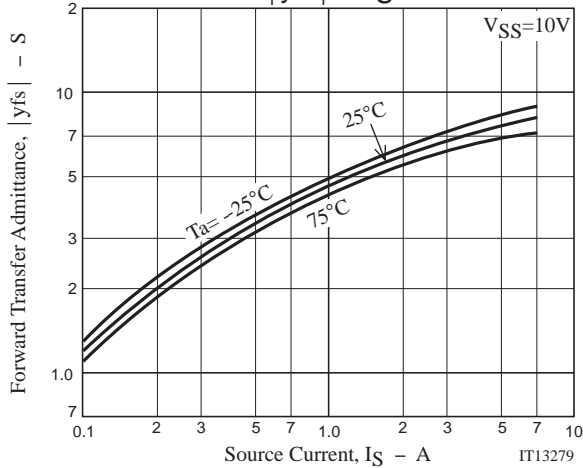
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R_{SS(on)} - T_a



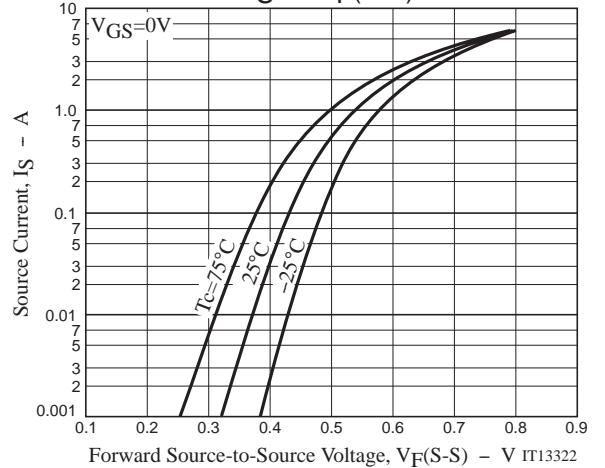
IT13278

|y_{fs}| - I_S



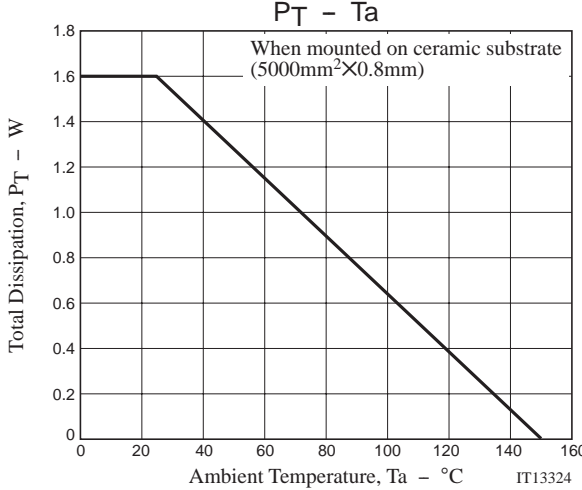
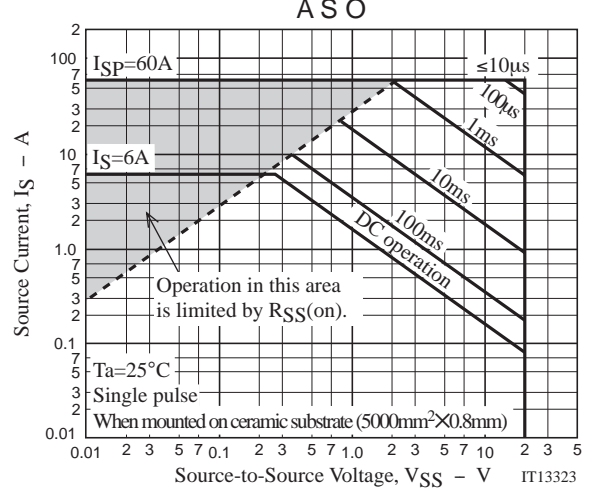
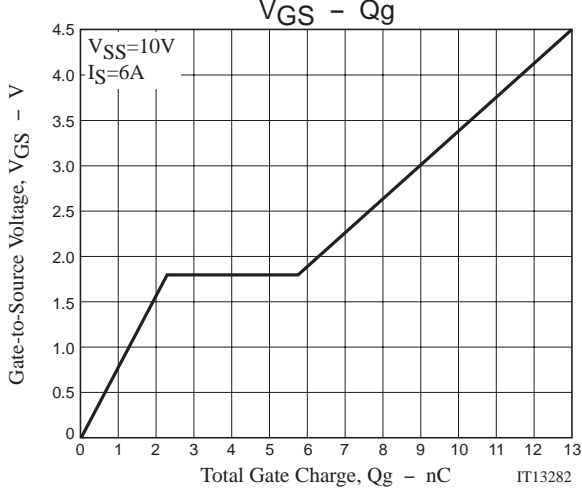
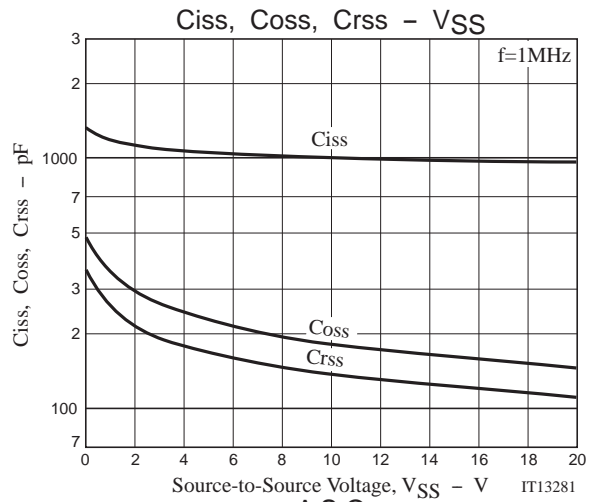
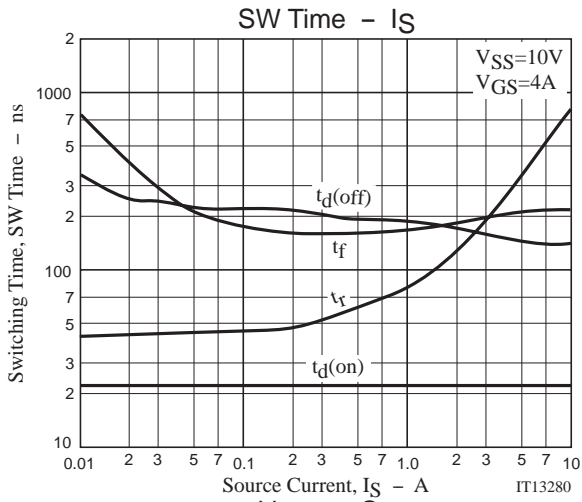
IT13279

I_S - V_{F(S-S)}



IT13322

EFC4602



Note on usage : Since the EFC4602 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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