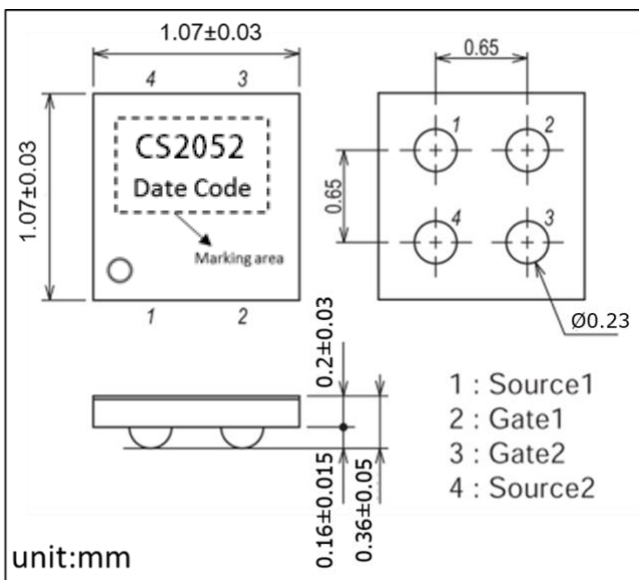
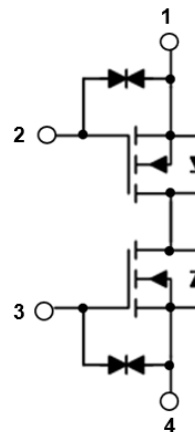
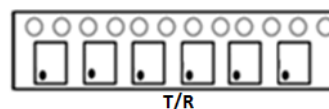



**Features**

- ★ 2.5V Drive
- ★ Common-drain type
- ★ ESD Protection

**Product Summary**

V <sub>SS</sub>	R <sub>SS(ON)</sub> Max	I <sub>S</sub> Max
24V	45.0mΩ @ 4.5V	6A
	48.0mΩ @ 4.0V	
	57.0mΩ @ 3.1V	
	70.0mΩ @ 2.5V	

**WLCSP Package Dimensions**

**Electrical Connection**

**Taping Type: T/R**


- Package : CSP
- JEITA, JEDEC :---
- Minimum Packing Quantity:5000pcs. / reel

**Absolute Maximum Ratings (T<sub>A</sub>=25°C)**

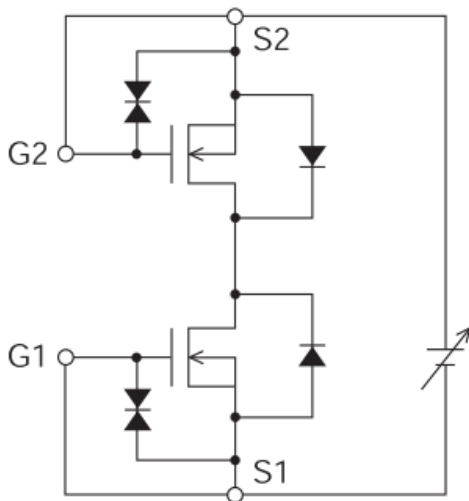
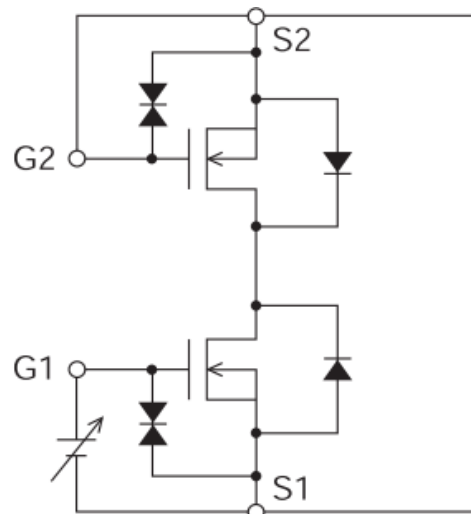
Symbol	Parameter	Rating	Units
V <sub>SS</sub>	Source to Source Voltage	24	V
V <sub>GSS</sub>	Gate to Source Voltage	±12	V
I <sub>S</sub>	Continuous Source Current <sub>1</sub>	6	A
I <sub>SP</sub>	Pulsed Source Current <sub>2</sub>	60	A
P <sub>T</sub>	Total Power Dissipation <sub>1</sub>	1.6	W
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C

**Electrical Characteristics at T<sub>A</sub>=25°C**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>SSS</sub>	Source-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =250uA	24	---	---	V
R <sub>SS(ON)</sub>	Static Source-Source On-State Resistance	V <sub>GS</sub> =4.5V, I <sub>S</sub> =1.5A	27	40	45	mΩ
		V <sub>GS</sub> =4.0V, I <sub>S</sub> =1.5A	28	42	48	
		V <sub>GS</sub> =3.7V, I <sub>S</sub> =1.5A	31	44	51	
		V <sub>GS</sub> =3.1V, I <sub>S</sub> =1.5A	36	46	57	
		V <sub>GS</sub> =2.5V, I <sub>S</sub> =1.5A	42	52	70	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>SS</sub> =V <sub>GS</sub> , I <sub>S</sub> =250uA	0.5	0.65	1.2	V
I <sub>SSS</sub>	Zero Gate Voltage Source Current	V <sub>SS</sub> =24V, V <sub>GS</sub> =0V	---	---	1	uA
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±8V, V <sub>SS</sub> =0V	---	---	±10	uA
G <sub>fs</sub>	Forward Transconductance	V <sub>SS</sub> =10V, I <sub>S</sub> =3.0A	---	5.5	---	S
Q <sub>g</sub>	Total Gate Charge <sub>3</sub>	V <sub>SS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>S</sub> =6A	---	12	---	nC
T <sub>d(on)</sub>	Turn-On Delay Times <sub>3</sub>	V <sub>DD</sub> =10V, V <sub>GS</sub> =4.5V, R <sub>G</sub> =3.3Ω I <sub>S</sub> =3A	---	8	---	ns
T <sub>r</sub>	Rise Times <sub>3</sub>		---	12	---	
T <sub>d(off)</sub>	Turn-Off Delay Times <sub>3</sub>		---	312	---	
T <sub>f</sub>	Fall Times <sub>3</sub>		---	36	---	
V <sub>FSS</sub>	Forward Source-Source Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =1.5A	---	0.72	1.2	V

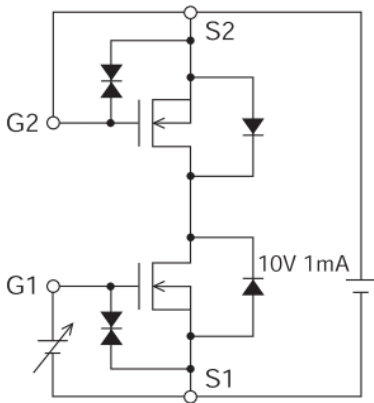
Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width ≤ 10us , duty cycle ≤ 1%
- 3.Guaranteed by design, not subject to production testing.

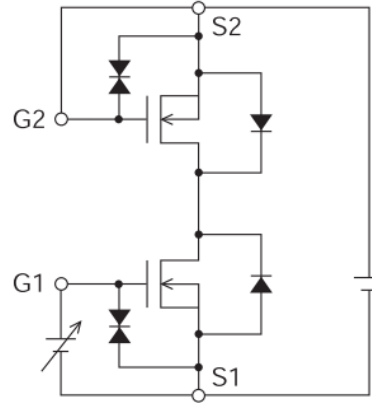
**Test circuits are example of measuring FET1 sides**
**Test Circuit 1 V<sub>SSS</sub> / I<sub>SSS</sub>**

**Test Circuit 2 I<sub>GSS</sub>(+) / (-)**


## Dual N-Ch Fast Switching MOSFETs

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

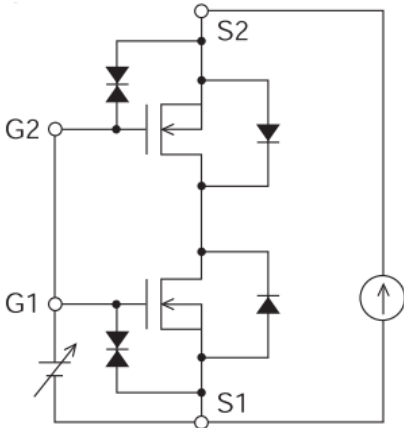


**Test Circuit 4  $G_{fs}$**

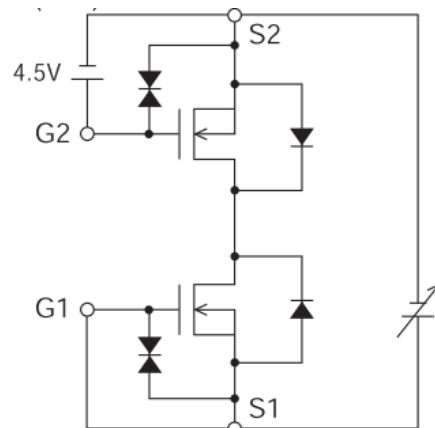


\* Note: Connect the measurement terminal reversely if you want to measure the FET2 side.

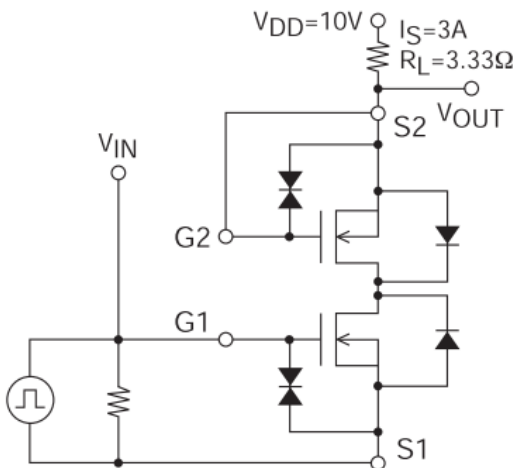
**Test Circuit 5  $R_{SS(ON)}$**



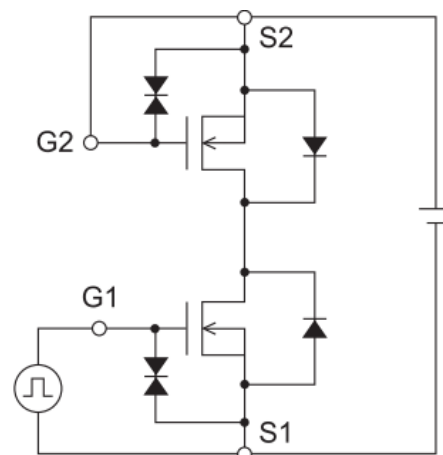
**Test Circuit 6  $V_{F(S-S)}$**



**Test Circuit 7  $T_{d(on)}$ ,  $T_r$ ,  $T_{d(off)}$ ,  $T_f$**

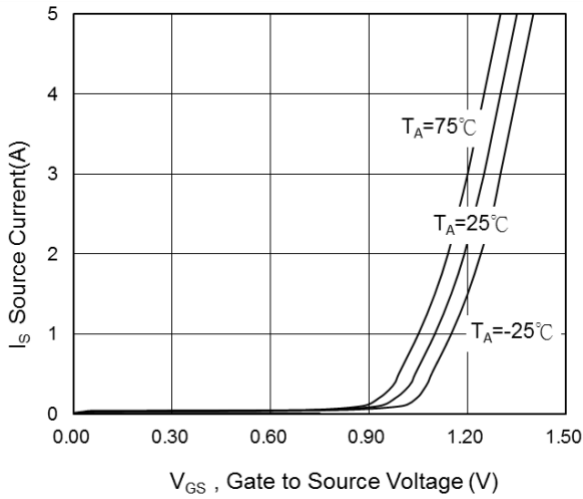


**Test Circuit 8  $Q_g$**

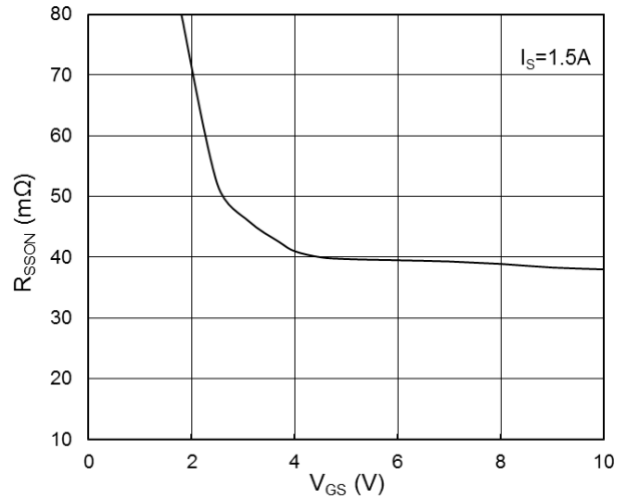


\* Note: Connect the measurement terminal reversely if you want to measure the FET2 side.

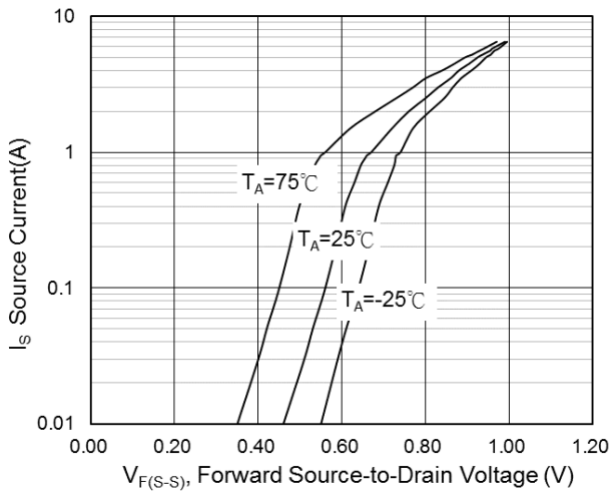
**Dual N-Ch Fast Switching MOSFETs**



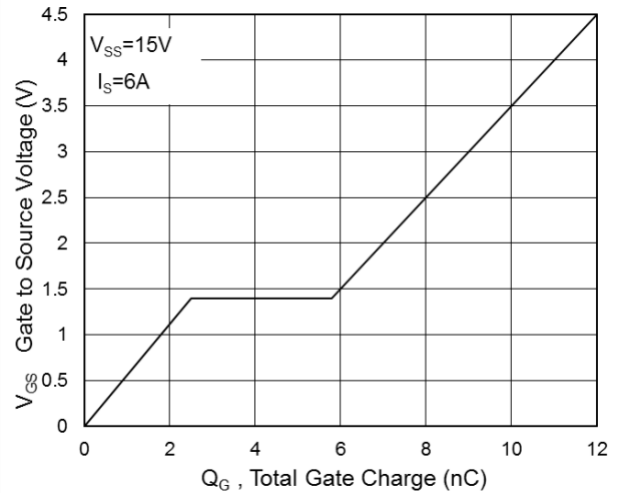
**Fig.1  $I_S$  -  $V_{GS}$**



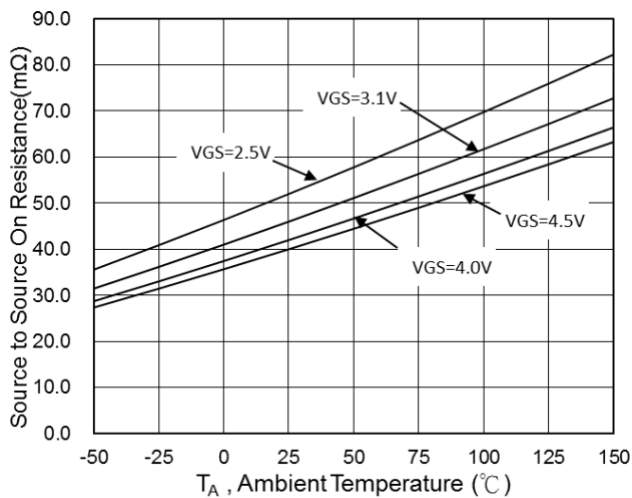
**Fig.2  $R_{SS(ON)}$  -  $V_{GS}$**



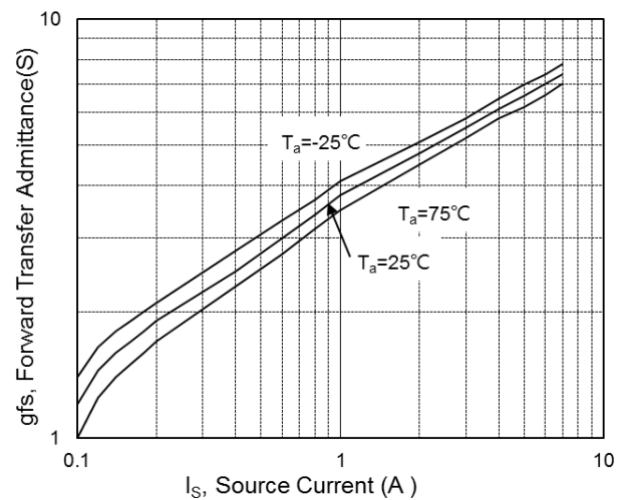
**Fig.3  $I_S$  -  $V_{F(S-S)}$**



**Fig.4  $V_{GS}$  -  $Q_g$**

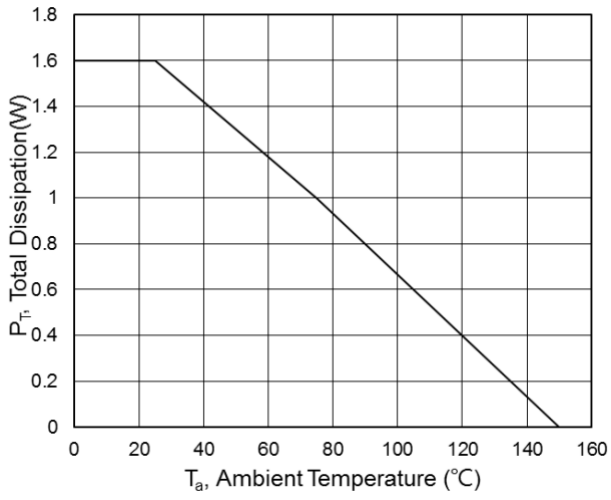


**Fig.5  $R_{SS(ON)}$  -  $T_A$**

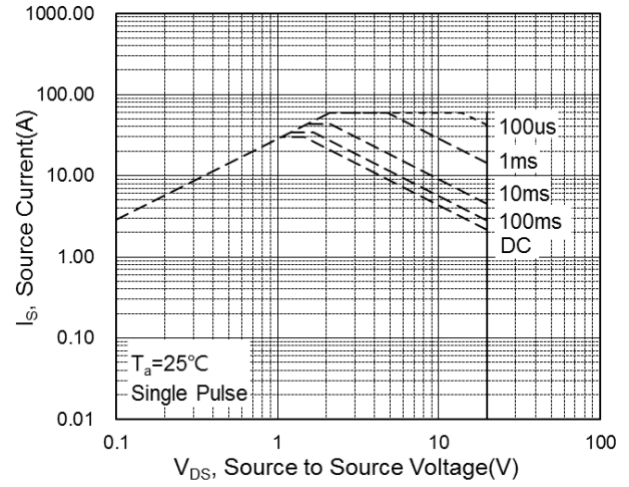


**Fig.6  $g_{fs}$  vs  $I_S$**

## Dual N-Ch Fast Switching MOSFETs



**Fig.7 P<sub>T</sub> – T<sub>A</sub>**



**Fig.8 Safe Operating Area**