MOSFET MODULE

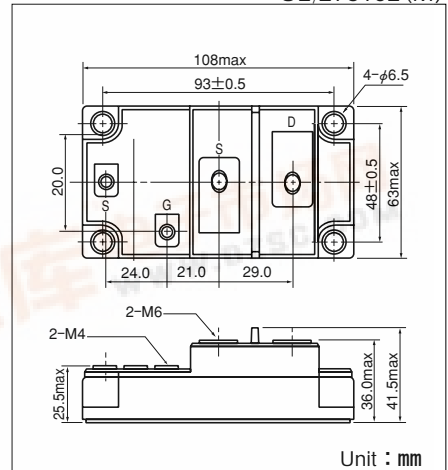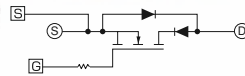# SF100CB100

SF100CB100 is a isolated power MOSFET module designed for fast swiching applications of high voltage and current with a fast recovery diode（trr≦300ns）reverse connected. The mounting base of the module is electrically isolated from semiconductor elements for simple heatsink construction.

- I_D＝100A, V_{DSS}＝1000V
- Suitable for high speed switching applications.
- Low ON resistance.
- Wide Safe Operating Areas.
- trr≦**300ns** fast recovery diode for free wheel

（**Applications**）

UL；E76102（M）

Unit：**mm**

■Maximum Ratings

（Tj＝25℃ unless otherwise specified）

Symbol	Item		Conditions	Ratings SF100CB100	Unit
V_{DSS}	Drain-Source Voltage			1000	V
V_{GSS}	Gate-Source Voltage			±30	V
I_D	Drain Current	DC		100	A
I_{DP}		Pulse		200	
$-I_D$	Source Current			100	A
P_T	Total Power Dissipation		Tc＝25℃	800	W
Tj	Channel Temperature			−40 to ＋150	℃
Tstg	Storage Temperature			−40 to ＋125	℃
V_{ISO}	Isolation Voltage（R.M.S.）		A.C. 1minute	2500	V
	Mounting Torque	Mounting（M6）	Recommended Value 2.5-3.9（25-40）	4.7（48）	N·m (kgf·cm)
		Terminal（M6）	Recommended Value 2.5-3.9（25-40）	4.7（48）	
		Terminal（M4）	Recommended Value 1.0-1.4（10-14）	1.5（15）	
	Mass		Typical Value	460	g

■Electrical Characteristics

（Tj＝25℃ unless otherwise specified）

Symbol	Item		Conditions	Min.	Typ.	Max.	Unit
I_{GSS}	Gate Leakage Current		V_{GS}＝±20V, V_{DS}＝0V			±0.1	μA
I_{DSS}	Zero Gate Voltage Drain Current		V_{GS}＝0V, V_{DS}＝800V			4.0	mA
$V_{(BR)DSS}$	Darin-Source Breakdown Voltage		V_{GS}＝0V, I_D＝1mA	1000			V
$V_{GS(th)}$	Gate-Source Threshold Voltage		V_{DS}＝V_{GS}, I_D＝10mA	1.5		3.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance		I_D＝100A, V_{GS}＝15V			150	mΩ
$V_{DS(on)}$	Drain-Source On-State Voltage		I_D＝100A, V_{GS}＝15V			15	V
gfs	Forward Transconductance		V_{DS}＝10A, V_D＝75A	30	50		S
Ciss	Input Capacitance		V_{GS}＝0V, V_{DS}＝25V, f＝1.0MHz		16000	19200	pF
Coss	Output Capacitance		V_{GS}＝0V, V_{DS}＝25V, f＝1.0MHz		2900	4200	pF
Crss	Reverse Transfer Capacitance		V_{GS}＝0V, V_{DS}＝25V, f＝1.0MHz		1800	2600	pF
td(on)	Switching Time	Turn-on Delay Time	R_L＝6Ω, V_{GS}＝15V/−5V I_D＝100A, R_G＝2.2Ω			150	ns
tr		Rise Time				300	
td(off)		Turn-off Delay Time				600	
tf		Fall Time				300	
V_{SDS}	Diode Forward Voltage		$-I_D$＝100A, V_{GS}＝0V			1.8	V
trr	Reverse Recovery Time		$-I_D$＝100A, V_{GS}＝15V, di/dt＝400A/μs			300	ns
Rth(j-c)	Thermal Resistance	MOSFET				0.16	℃/W
		Diode				0.64	

Output Characteristics

Typical
Tj=25℃
Pulse Test

15V 10V
8V
6V
5V
VGS=4V

Drain Current ID (A)
Drain-Source Voltage VDS (V)

Forward Transfer Characteristics

Typical
VDS=50V
Pulse Test

Tj=25℃   Tj=100℃

Drain Current ID (A)
Gate-Source Voltage VGS (V)

Forward Transconductance Vs. Drain Current

Tj=25℃
Tj=100℃

Typical
VDS=50V
Pulse Test

Forward Transconductance gfs (S)
Drain Current ID (A)

Drain-Source On-State Resistance Vs. Channel Temperature

Typical
VGS=15V
Pulse Test

ID=100A   ID=50A

Drain-Source On-State Resistance RDS(on) (Ω)
Channel Temperature Tj (℃)

Drain-Source On-State Resistance Vs. Drain Current

10V   VGS=15V

Typical
Tj=25℃
Pulse Test

Drain-Source On-State Resistance RDS(on) (Ω)
Drain Current ID (A)

Input Capacitance, Output Capacitance, Reverse Transfer Capacitance（Typical）

Ciss
Coss
Crss

VGS=0V
f=1MHz
Tj=25℃
(Typical)

Capacitance C (pF)
Drain-Source Voltage VDS (V)

Input Charge

Typical
ID=100A
Tj=25℃

VDD=250V   VDD=400V

Gate-Source Voltage VGS (V)
Gate Charge Qg (nC)

Safe Operating Area

Pw=50μs
Pw=100μs
Pw=1ms
Pw=10ms
D.C.

Tc=25℃
Non-Repetitive

Drain Current ID (A)
Drain-Source Voltage VDS (V)

Forward Voltage of Free Wheeling Diode

Reverse Drain Current $-I_D$ (A) vs Source-Drain Voltage V_{SDS} (V)

Tj=125℃
Tj=25℃

Typical
V$_{GS}$=0V
Pulse Test

Reverse Recovery Characteristics

Reverse Recovery Time trr (ns) / Reverse Recovery Current Irr (A) / Reverse Recovery Charge Qrr (μC) vs Source Current Is (A)

Irr
Irr
Qrr
Qrr

Typical
dis/dt=100A/μs
V$_{GS}$=−5V

trr
trr

Tj=25℃
Tj=150℃

Switching Characteristics

Switching Time t (ns) vs Drain Current I_D (A)

td(off)
tf
tr
td(on)

Tj=25℃
V$_{GS}$=+15V −5V
V$_{DD}$=600V
Pw =50μs
R$_G$ =2.2Ω

Transient Thermal Impedance（MOSFET）

Thermal Impedance θj-C (℃/W) vs Time t (sec)

50msec～10sec   Max.
50μsec～50msec

Transient Thermal Impedance（DIODE）

Thermal Impedance θj-C (℃/W) vs Time t (sec)

50msec～10sec   Max.
50μsec～50msec