Ordering number : ENA1367

SANYO Semiconductors

DATA SHEET

N-Channel Silicon MOSFET

2SK4197FG — General-Purpose Switching Device Applications

Features

- Low ON-resistance, low input capacitance, ultrahigh-speed switching.
- Adoption of high reliability HVP process.
- Attachment workability is good by Mica-less package.
- Avalanche resistance guarantee.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		600	V
Gate-to-Source Voltage	V_{GSS}		±30	V
Drain Current (DC)	I_{Dc} *1	Limited only by maximum temperature Tch=150°C	3.5	A
	I_{Dpack} *2	Tc=25°C (SANYO's ideal heat dissipation condition)*3	3.3	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	13	A
Allowable Power Dissipation	P_D		2.0	W
		Tc=25°C (SANYO's ideal heat dissipation condition)*3	28	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *4	E_{AS}		29	mJ
Avalanche Current *5	I_{AV}		3.3	A

Note :*1 Shows chip capability.

*2 Package limited.

*3 SANYO's condition is radiation from backside.

The method is applying silicone grease to the backside of the device and attaching the device to water-cooled radiator made of aluminium.

*4 V_{DD}=50V, L=5mH, I_{AV}=3.3A

*5 L≤5mH, Single pulse

Marking : K4197

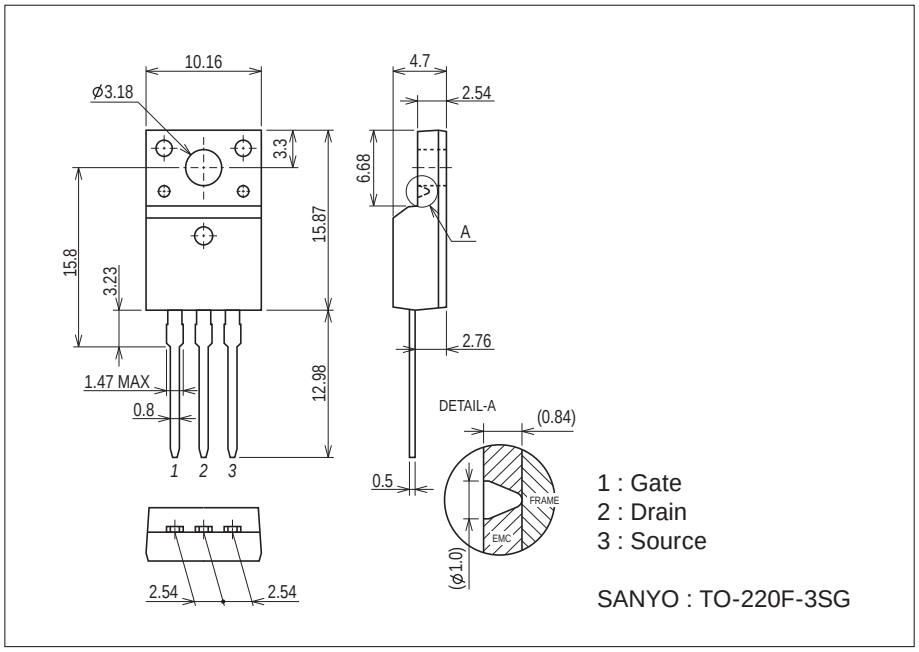
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=10mA, V_{GS}=0V	600			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=480V, V_{GS}=0V			100	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±30V, V_{DS}=0V			±100	nA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	3		5	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=1.8A	0.8	1.6		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)	I_D=1.8A, V_{GS}=10V		2.5	3.25	Ω
Input Capacitance	Ciss	V_{DS}=30V, f=1MHz		260		pF
Output Capacitance	Coss	V_{DS}=30V, f=1MHz		50		pF
Reverse Transfer Capacitance	Crss	V_{DS}=30V, f=1MHz		9.7		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		12		ns
Rise Time	t_r	See specified Test Circuit.		20		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		28		ns
Fall Time	t_f	See specified Test Circuit.		12		ns
Total Gate Charge	Qg	V_{DS}=200V, V_{GS}=10V, I_D=3.5A		11		nC
Gate-to-Source Charge	Qgs	V_{DS}=200V, V_{GS}=10V, I_D=3.5A		2.6		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=200V, V_{GS}=10V, I_D=3.5A		5.8		nC
Diode Forward Voltage	V_{SD}	I_S=3.5A, V_{GS}=0V		0.9	1.2	V

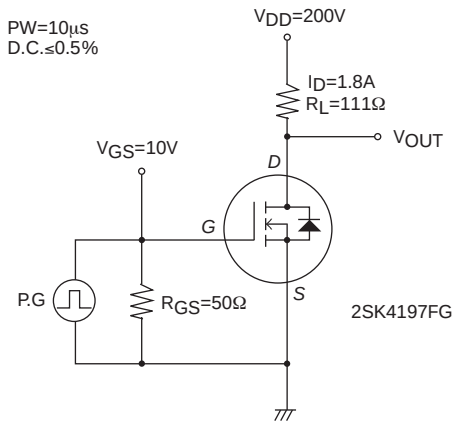
Package Dimensions

unit : mm (typ)

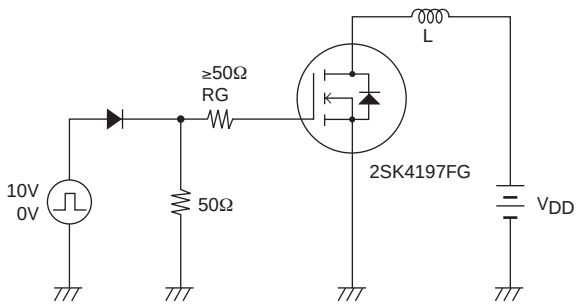
7529-001



Switching Time Test Circuit



Avalanche Resistance Test Circuit



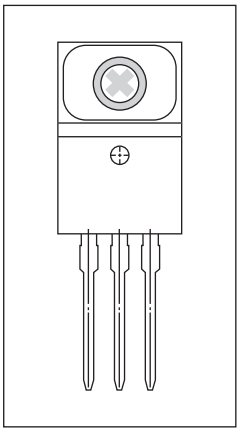
For this package, a part of inner electrode is exposed. Please refer to the package outline for the detailedstructure.
So when mounting the device, please pay enough attention to the isolation with the heatsink.
According to the device mounting method, sometimes the insulation voltage may be decreased.
(refer to the below insulation characteristics)

Insulation / Ta=25°C / RH75%

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Lead & resin insulation *	$V_{ISO}1$	Metal spacer Refer to Fig.1		1600		Vrms
	$V_{ISO}2$	Washer 5.8mm Refer to Fig.2		2100		Vrms
	$V_{ISO}3$	Insulated screw, Insulated washer		3900		Vrms

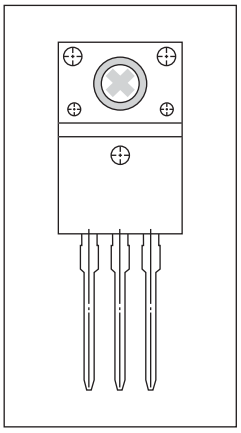
* : AC voltage measurement

Fig.1



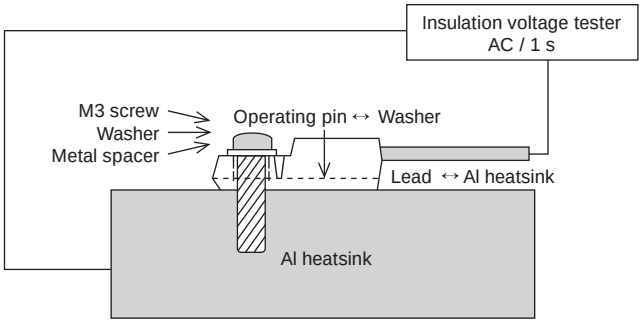
IT14077

Fig.2

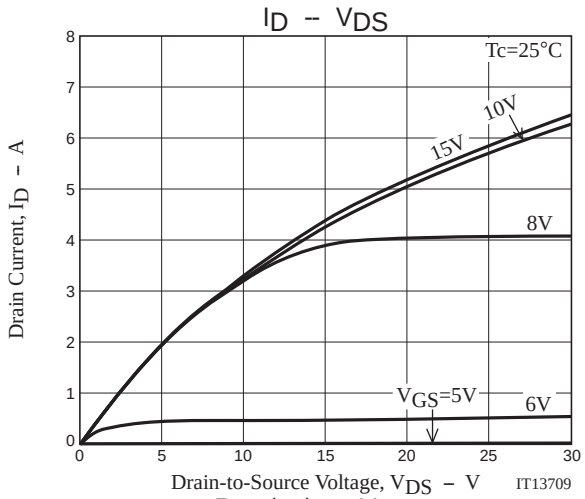


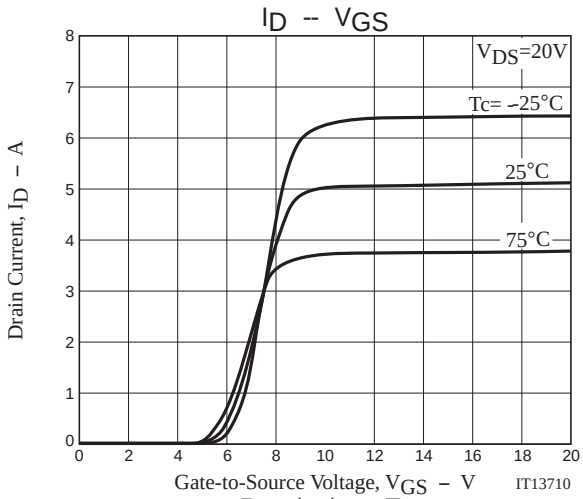
IT14078

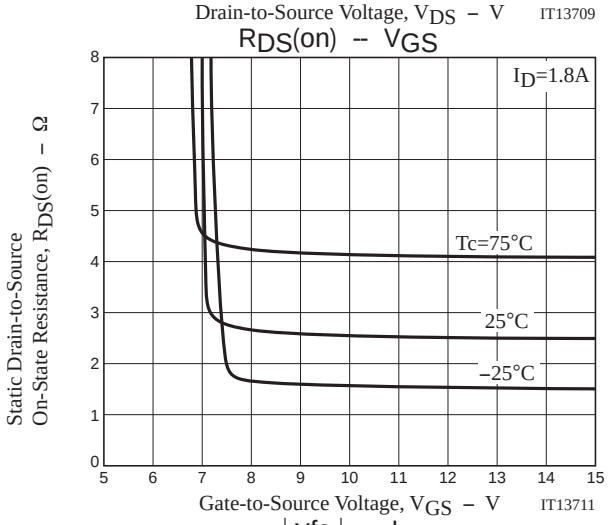
Insulation Measuring Diagram

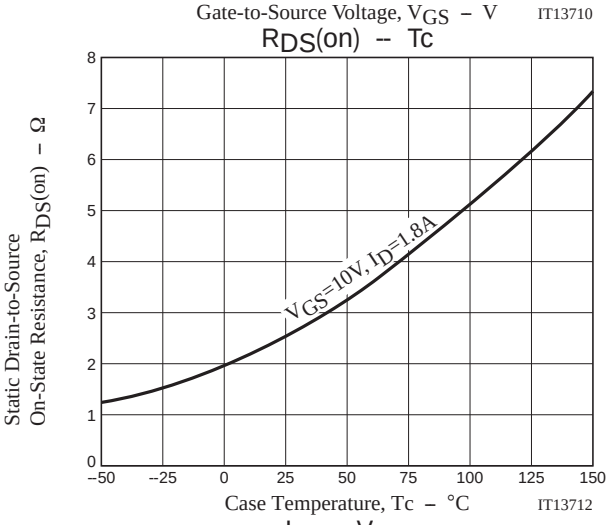


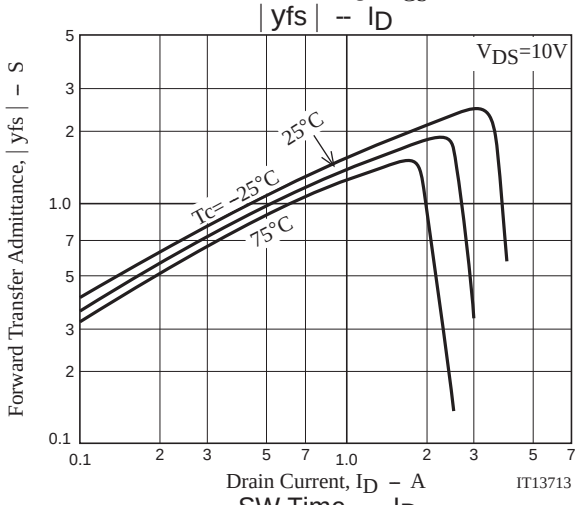
IT14079

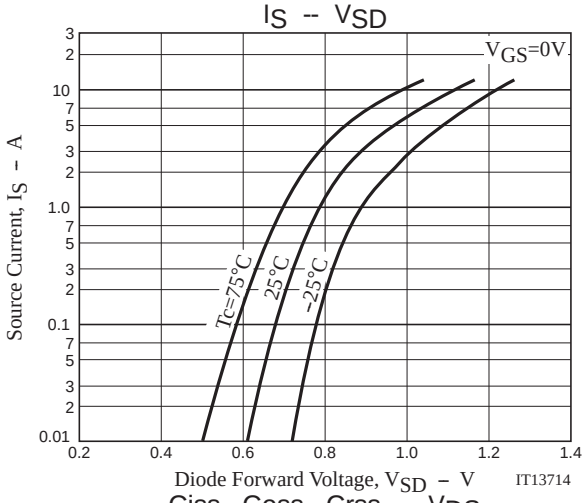

ID -- VDS
Tc=25°C
10V
15V
8V
VGS=5V
6V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT13709

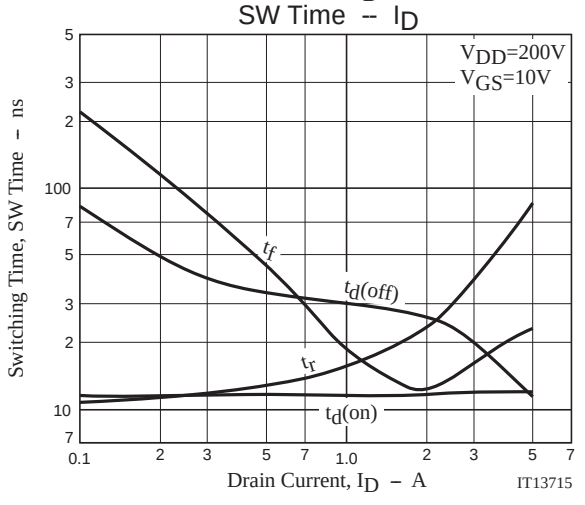

ID -- VGS
VDS=20V
Tc= –25°C
25°C
75°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT13710

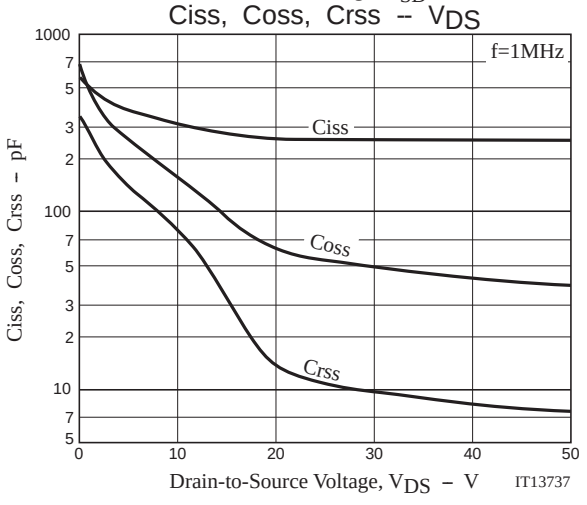

RDS(on) -- VGS
ID=1.8A
Tc=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V
IT13711

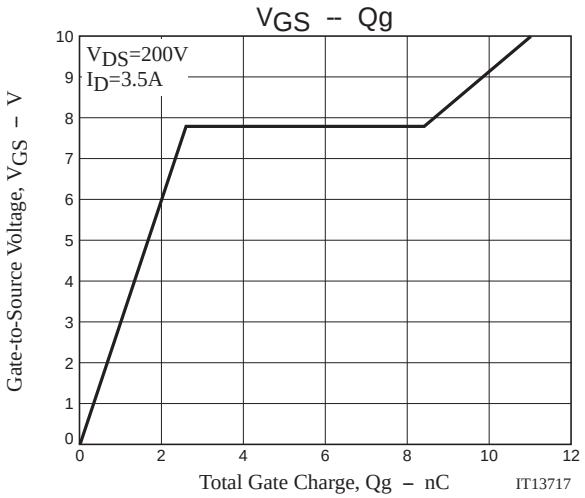

RDS(on) -- Tc
VGS=10V, ID=1.8A
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Case Temperature, Tc – °C
IT13712

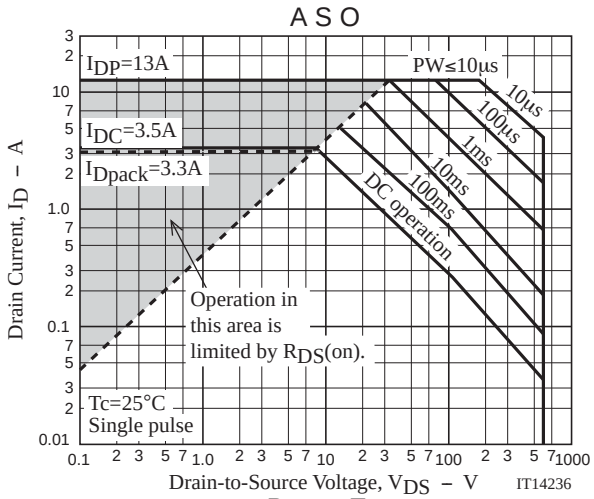

| yfs | -- ID
VDS=10V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT13713

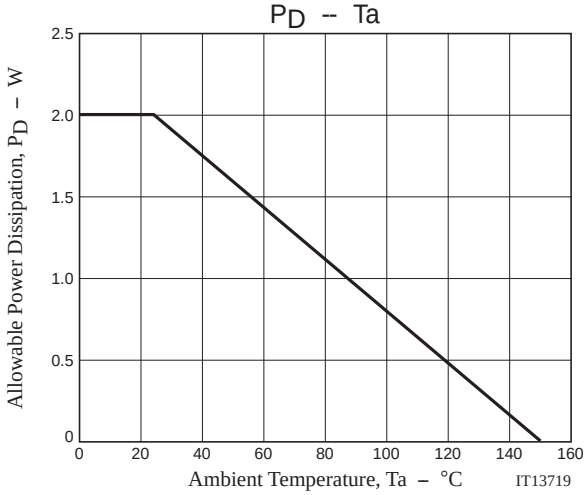

IS -- VSD
VGS=0V
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT13714

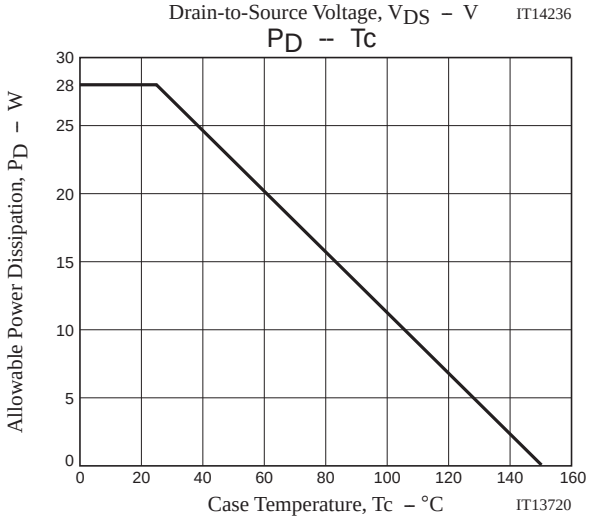

SW Time -- ID
VDD=200V
VGS=10V
tf
td(off)
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT13715

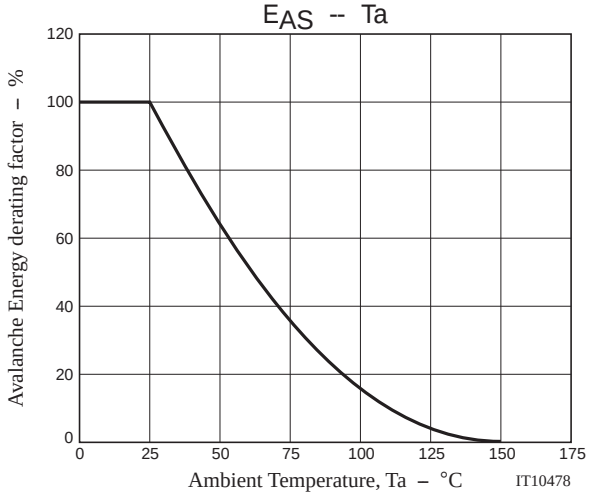

Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT13737


VGS – Qg
VDS=200V
ID=3.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT13717


A S O
IDP=13A
PW≤10μs
IDC=3.5A
IDpack=3.3A
10μs
100μs
1ms
10ms
100ms
DC operation
Operation in this area is limited by RDS(on).
Tc=25°C
Single pulse
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT14236


PD -- Ta
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT13719


PD -- Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
IT13720


EAS -- Ta
Avalanche Energy derating factor – %
Ambient Temperature, Ta – °C
IT10478

Note on usage : Since the 2SK4197FG is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

This catalog provides information as of November, 2008. Specifications and information herein are subject to change without notice.