



SANYO Semiconductors

## DATA SHEET

# 2SK4098FG — N-Channel Silicon MOSFET

## 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  $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	$V_{DSS}$		600	V
Gate-to-Source Voltage	$V_{GSS}$		$\pm 30$	V
Drain Current (DC)	$I_{DC}^*1$	Limited only by maximum temperature $T_{ch}=150^\circ\text{C}$	7	A
	$I_{Dpack}^*2$	$T_c=25^\circ\text{C}$ (SANYO's ideal heat dissipation condition)*3	6	A
Drain Current (Pulse)	$I_{DP}$	$PW \leq 10\mu\text{s}$ , duty cycle $\leq 1\%$	28	A
Allowable Power Dissipation	$P_D$		2.0	W
		$T_c=25^\circ\text{C}$ (SANYO's ideal heat dissipation condition)*3	33	W
Channel Temperature	$T_{ch}$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$
Avalanche Energy (Single Pulse) *4	$E_{AS}$		98	mJ
Avalanche Current *5	$I_{AV}$		6	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  $V_{DD}=50\text{V}$ ,  $L=5\text{mH}$ ,  $I_{AV}=6\text{A}$

\*5  $L \leq 5\text{mH}$ , Single pulse

Marking : K4098

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# 2SK4098FG

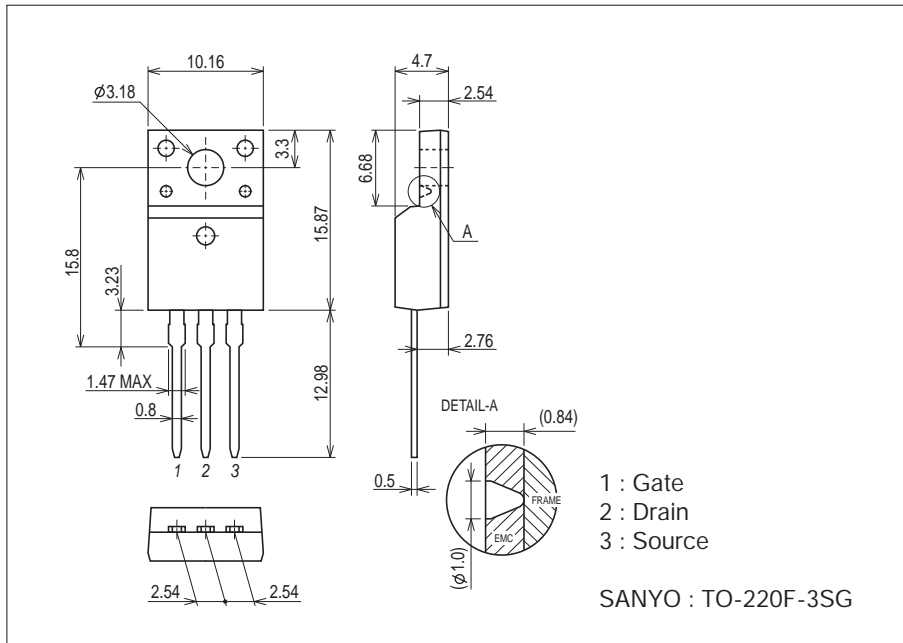
## Electrical Characteristics at Ta=25°C

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	$\mu A$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 30V, V_{DS}=0V$			$\pm 100$	nA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10V, I_D=1mA$	3		5	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10V, I_D=3.5A$	2.1	4.2		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)}$	$I_D=3.5A, V_{GS}=10V$		0.9	1.1	$\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=30V, f=1MHz$		600		pF
Output Capacitance	$C_{oss}$	$V_{DS}=30V, f=1MHz$		120		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS}=30V, f=1MHz$		25		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		17		ns
Rise Time	$t_r$	See specified Test Circuit.		34		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		80		ns
Fall Time	$t_f$	See specified Test Circuit.		30		ns
Total Gate Charge	$Q_g$	$V_{DS}=200V, V_{GS}=10V, I_D=7A$		23.5		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=200V, V_{GS}=10V, I_D=7A$		4.5		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$	$V_{DS}=200V, V_{GS}=10V, I_D=7A$		13.5		nC
Diode Forward Voltage	$V_{SD}$	$I_S=7A, V_{GS}=0V$		0.9	1.2	V

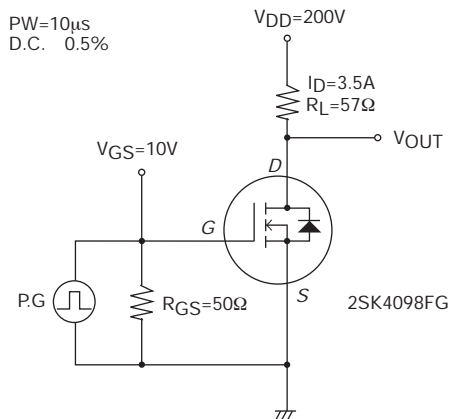
## Package Dimensions

unit : mm (typ)

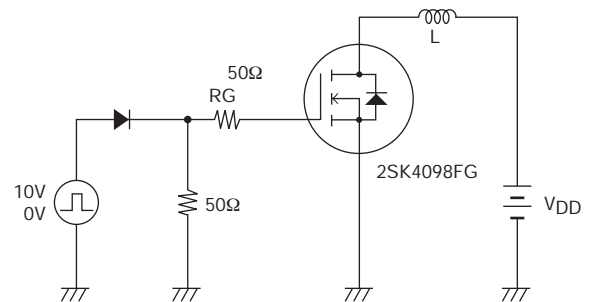
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## Switching Time Test Circuit



## Avalanche Resistance Test Circuit



# 2SK4098FG

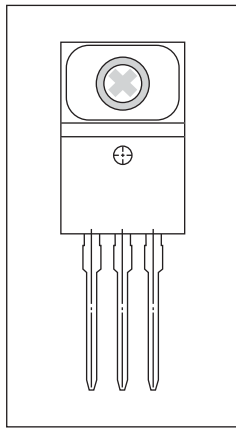
For this package, a part of inner electrode is exposed. Please refer to the package outline for the detailed structure.  
 So when mounting the device, please pay enough attention to the isolation with the heatsink.  
 According to the device mounting method, sometimes the insulation voltage may be decreased.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

## Insulation / Ta=25°C / RH75%

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Lead & resin insulation *	VISO1	Metal spacer Refer to Fig.1		1600		Vrms
	VISO2	Washer 5.8mm Refer to Fig.2		2100		Vrms
	VISO3	Insulated screw, Insulated washer		3900		Vrms

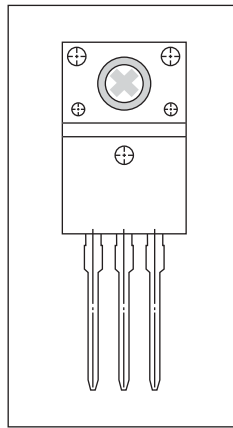
\* : AC voltage measurement

Fig.1



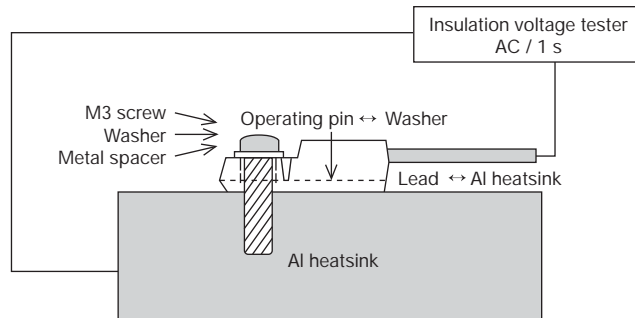
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Fig.2



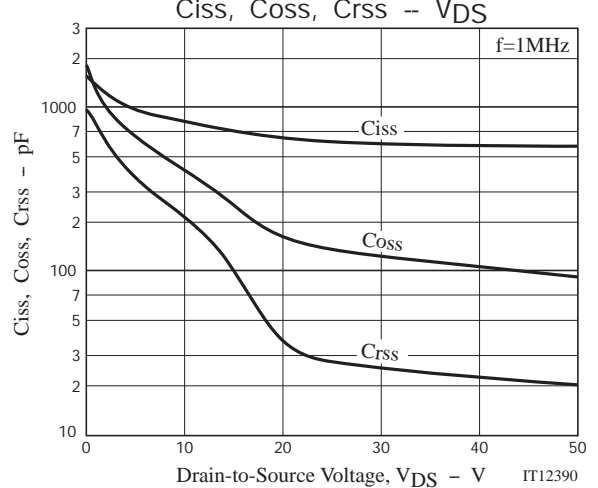
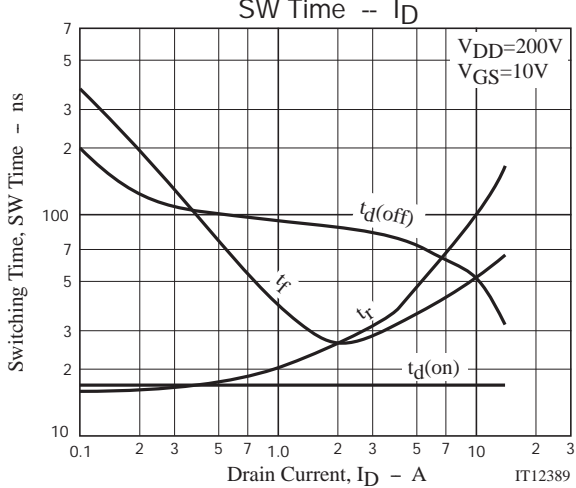
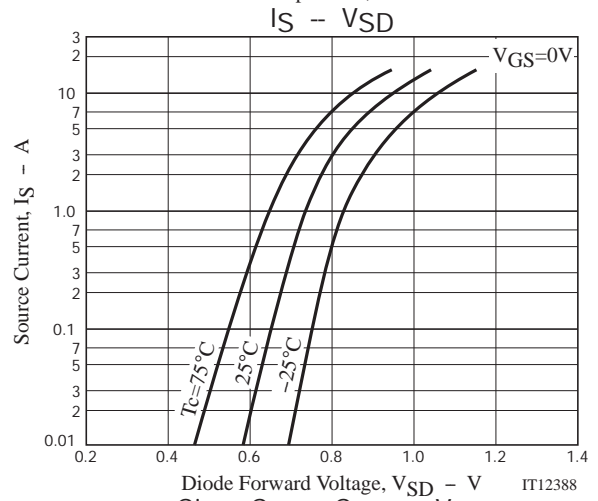
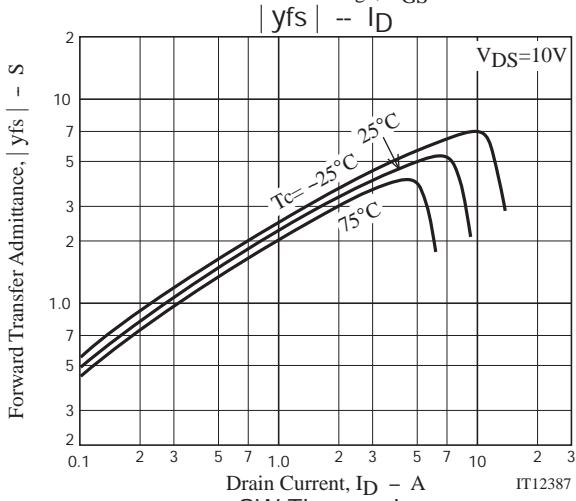
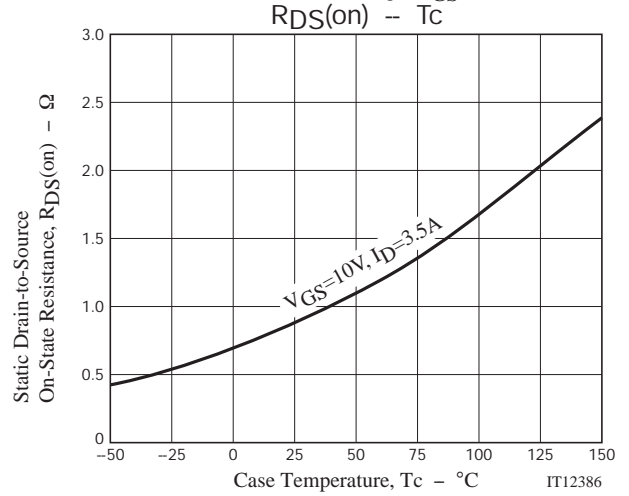
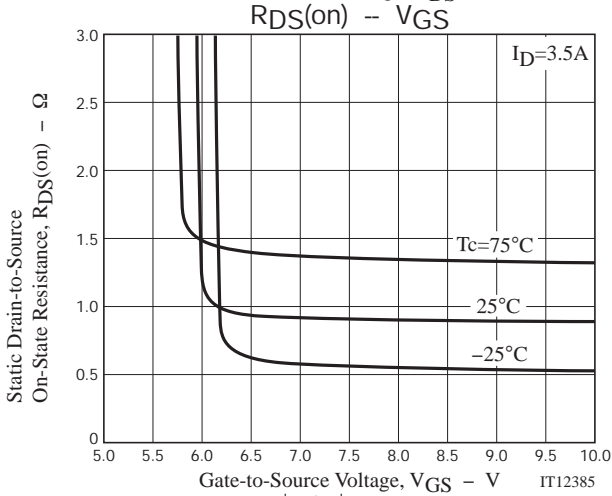
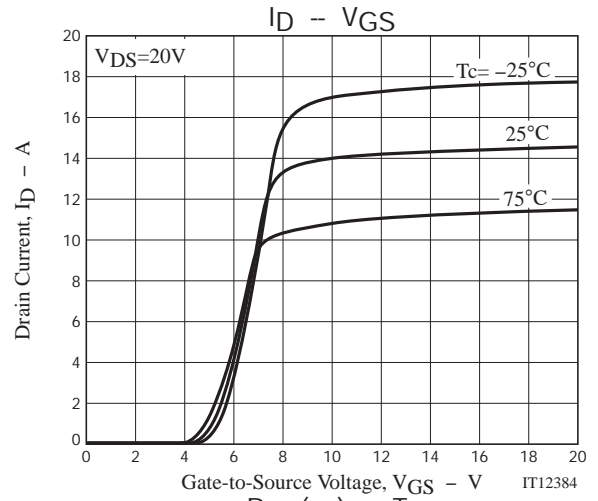
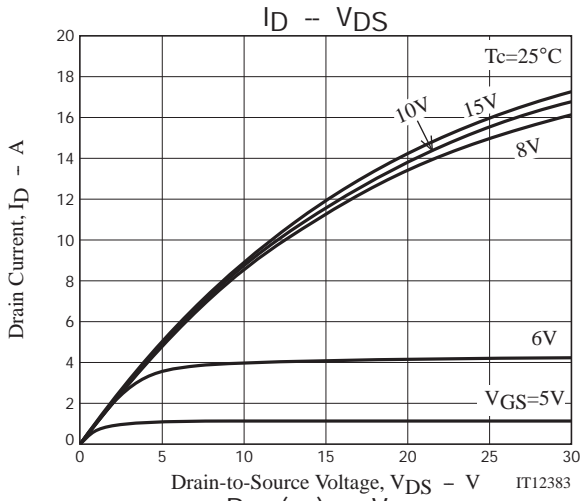
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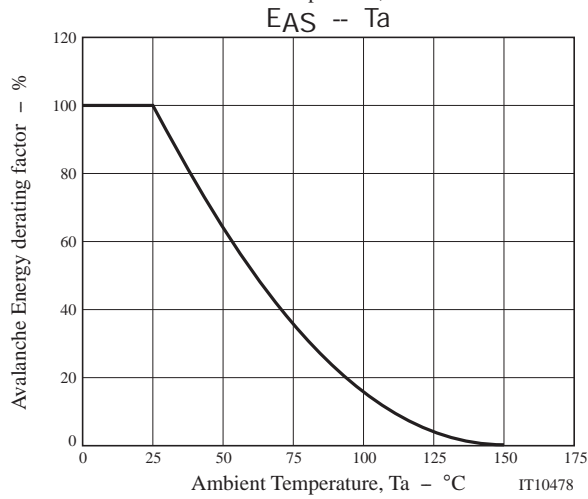
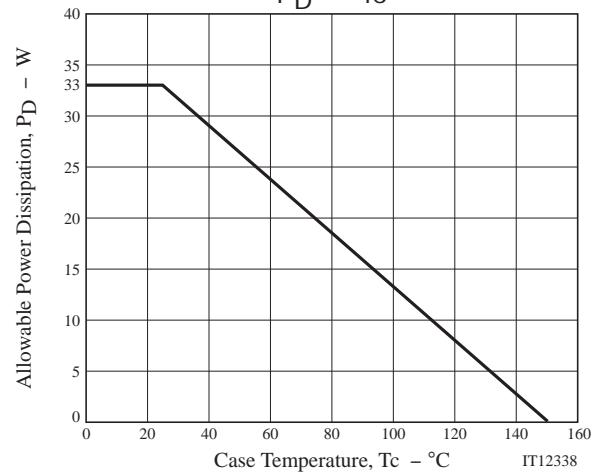
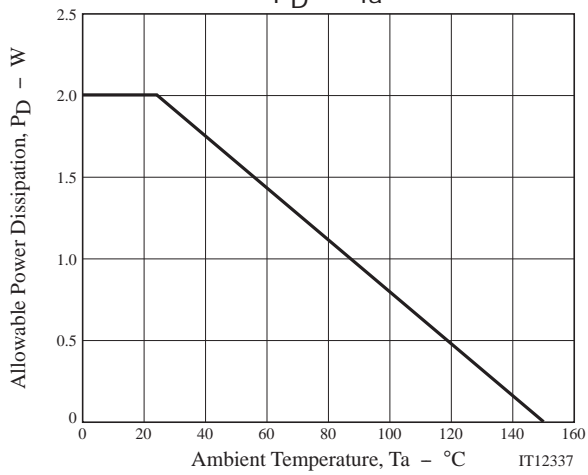
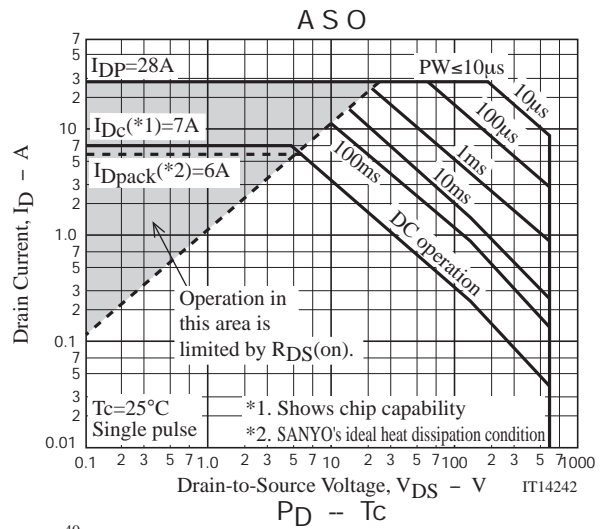
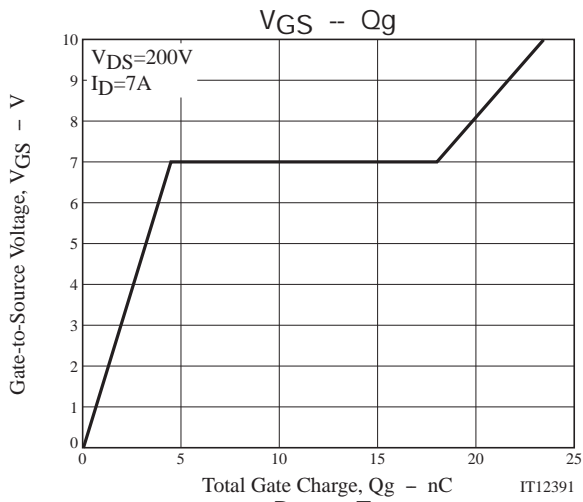
## Insulation Measuring Diagram



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2SK4098FG





Note on usage : Since the 2SK4098FG is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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