Ordering number : ENA0999

SANYO Semiconductors
DATA SHEET

N-Channel Silicon MOSFET

2SK4181 — General-Purpose Switching Device Applications

Features

- Low ON-resistance, low input capacitance, ultrahigh-speed switching.
- Adoption of high reliability HVP process.
- Avalanche resistance guarantee.
- For use of lighting & etc.
- High-density mounting.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		525	V
Gate-to-Source Voltage	V_{GSS}		±30	V
Drain Current (DC)	I_D		7.5	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	30	A
Allowable Power Dissipation	P_D	Tc=25°C (SANYO's ideal heat dissipation condition*1)	70	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single pulse) *2	E_{AS}		34	mJ
Avalanche Current *3	I_{AV}		7.5	A

*1 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.

*2 V_{DD}=99V, L=1mH, I_{AV}=7.5A

*3 L≤1mH, single pulse

Marking : K4181

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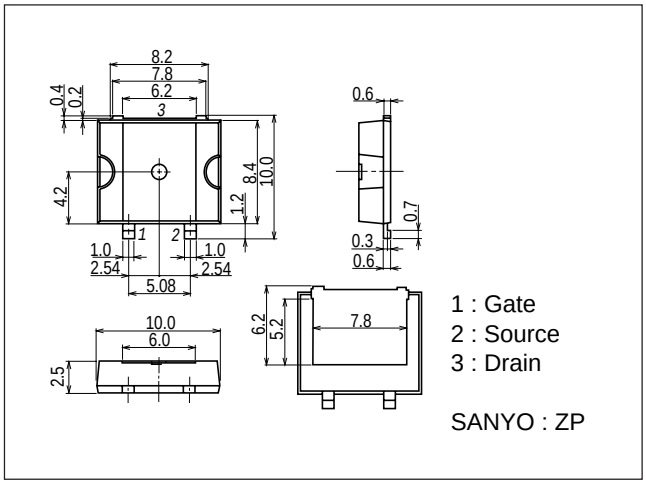
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=10mA, V_{GS}=0V	525			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=420V, 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=3.7A	1.9	3.8		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)	I_D=3.7A, V_{GS}=10V		0.71	0.92	Ω
Input Capacitance	Ciss	V_{DS}=30V, f=1MHz		600		pF
Output Capacitance	Coss	V_{DS}=30V, f=1MHz		125		pF
Reverse Transfer Capacitance	Crss	V_{DS}=30V, f=1MHz		27		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		20		ns
Rise Time	t_r	See specified Test Circuit.		60		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		77		ns
Fall Time	t_f	See specified Test Circuit.		38		ns
Total Gate Charge	Qg	V_{DS}=200V, V_{GS}=10V, I_D=7.5A		24		nC
Gate-to-Source Charge	Qgs	V_{DS}=200V, V_{GS}=10V, I_D=7.5A		4.5		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=200V, V_{GS}=10V, I_D=7.5A		13.8		nC
Diode Forward Voltage	V_{SD}	I_S=7.5A, V_{GS}=0V		0.9	1.2	V

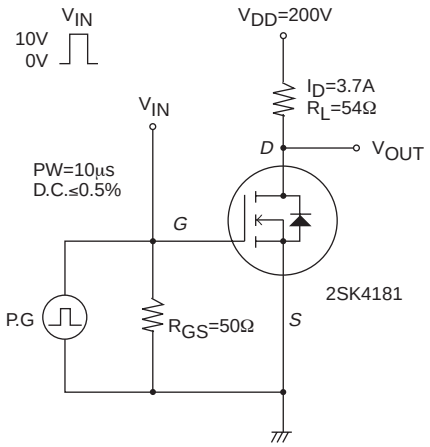
Package Dimensions

unit : mm (typ)

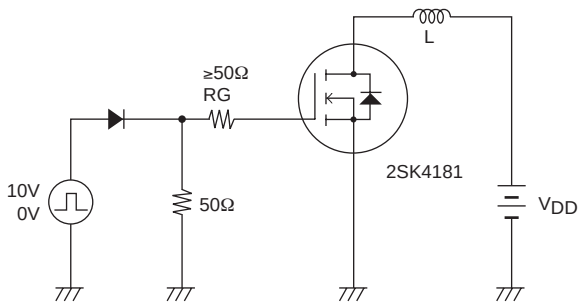
7002-001

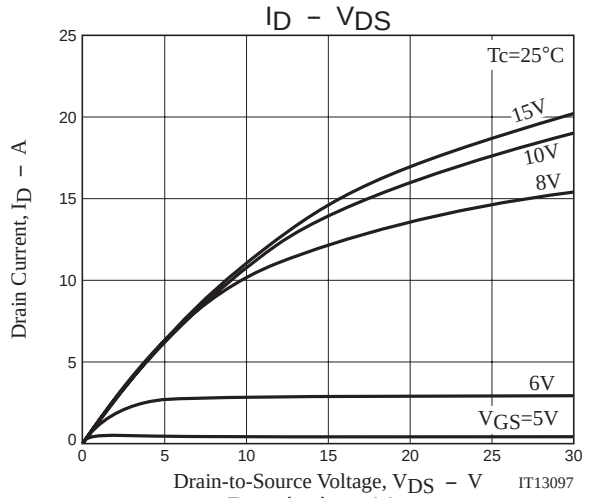


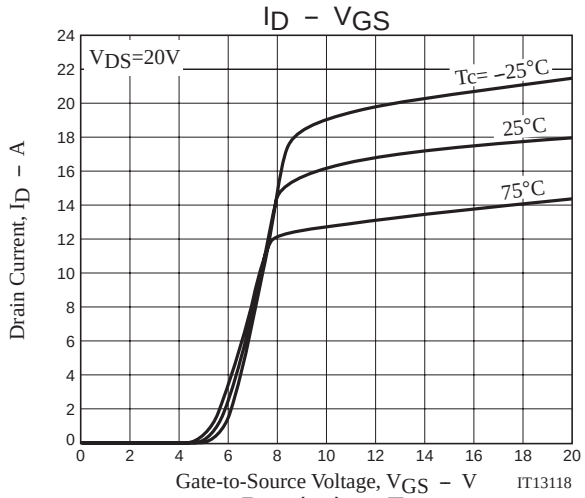
Switching Time Test Circuit

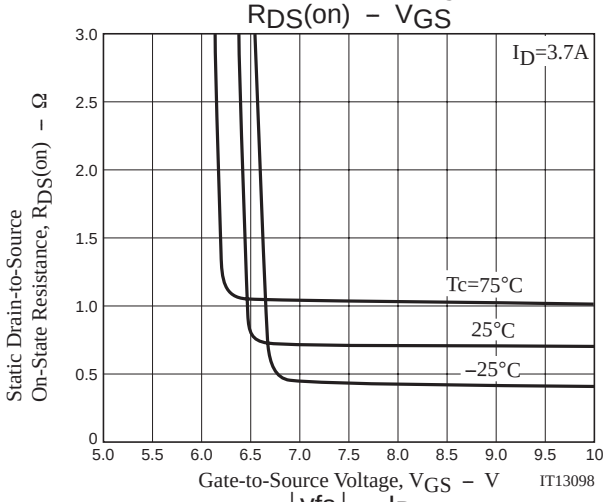


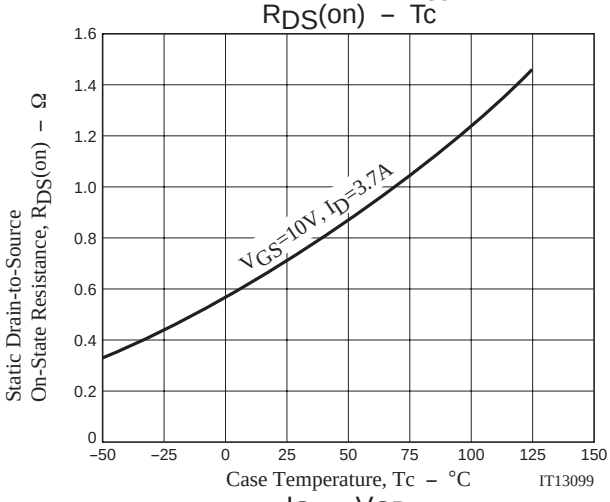
Avalanche Resistance Test Circuit

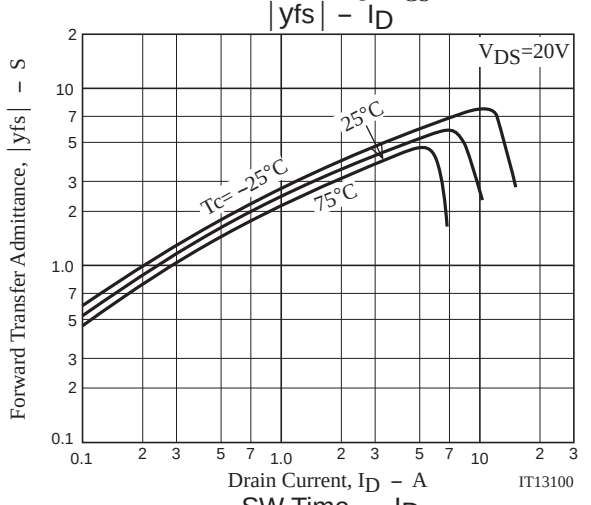


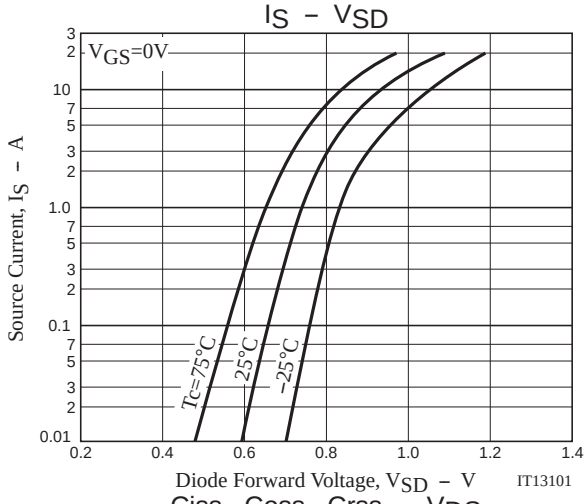

ID – VDS
Tc=25°C
15V
10V
8V
6V
VGS=5V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT13097

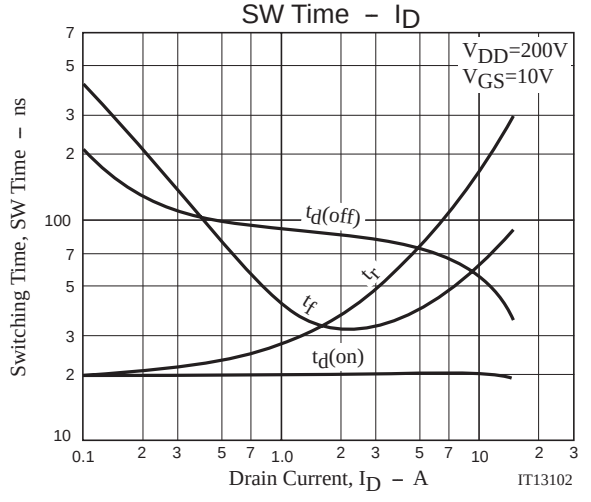

ID – VGS
VDS=20V
Tc= –25°C
25°C
75°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT13118

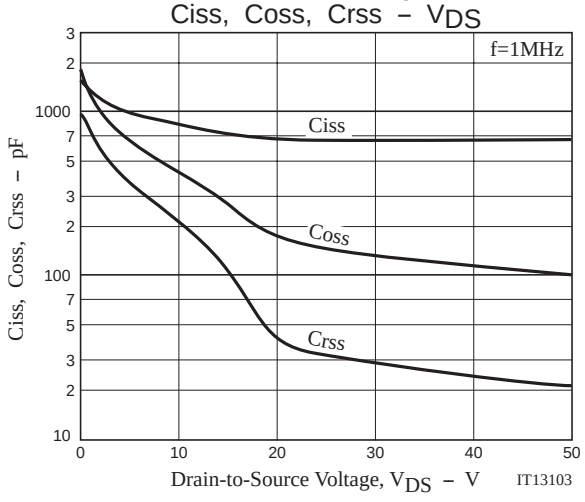

RDS(on) – VGS
ID=3.7A
Tc=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V
IT13098

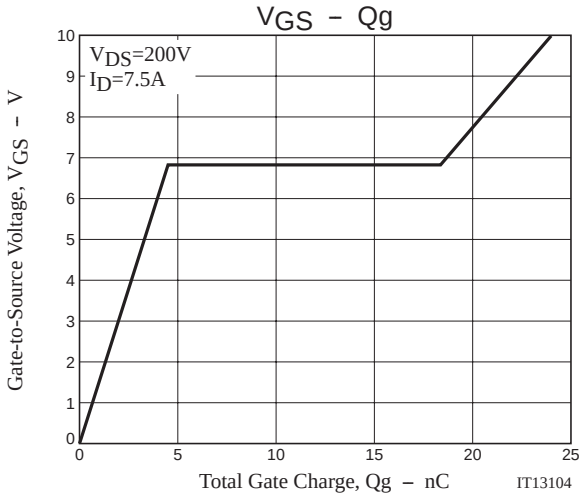

RDS(on) – Tc
VGS=10V, ID=3.7A
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Case Temperature, Tc – °C
IT13099

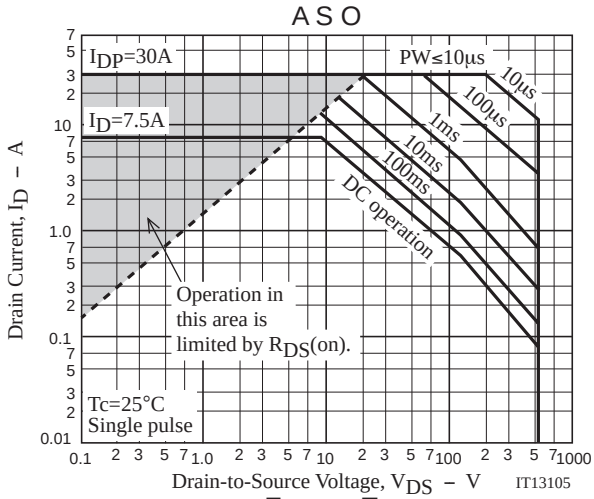

|yfs| – ID
VDS=20V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT13100

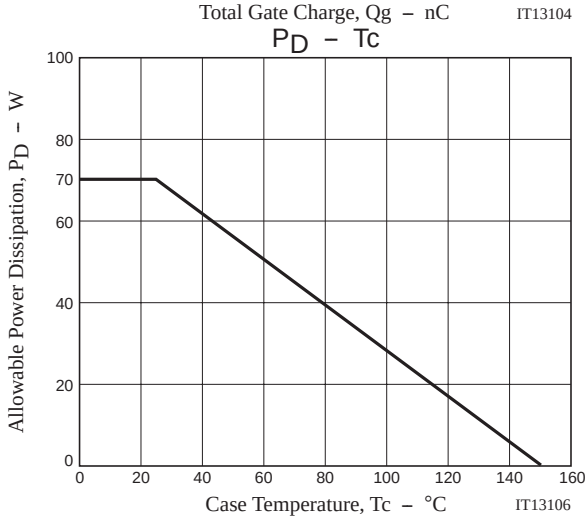

IS – VSD
VGS=0V
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT13101

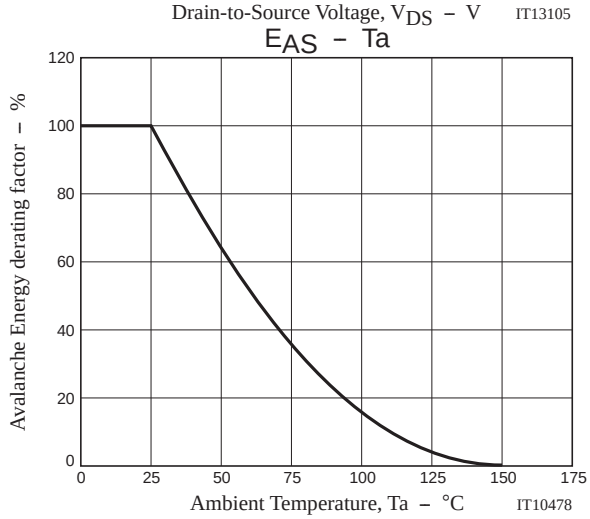

SW Time – ID
VDD=200V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT13102


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT13103









Note on usage : Since the 2SK4181 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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