Ordering number : ENA1516

SANYO Semiconductors
DATA SHEET

N-Channel Silicon MOSFET

2SK4209 — General-Purpose Switching Device Applications

Features

- Low ON-resistance, ultrahigh-speed switching.
- Adoption of high reliability HVP process.
- Avalanche resistance guarantee.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		800	V
Gate-to-Source Voltage	V_{GSS}		±30	V
Drain Current (DC)	I_D		12	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	24	A
Allowable Power Dissipation	P_D		2.5	W
		Tc=25°C	190	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *1	E_{AS}		410	mJ
Avalanche Current *2	I_{AV}		12	A

Note :*1 V_{DD}=99V, L=5mH, I_{AV}=12A
*2 L≤5mH, Single pulse

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	800			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=640V, V_{GS}=0V			1.0	mA
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	2.0		4.0	V

Marking : K4209

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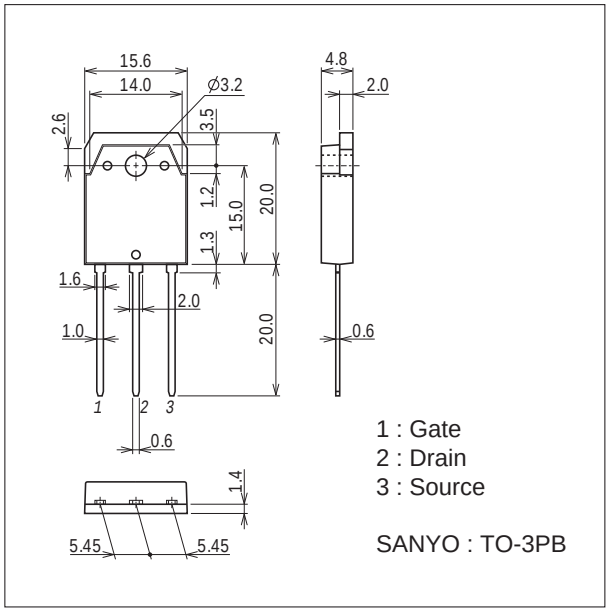
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Forward Transfer Admittance	| yfs |	V_{DS}=20V, I_D=6A	3.4	6.8		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)	I_D=6A, V_{GS}=10V		0.83	1.08	Ω
Input Capacitance	Ciss	V_{DS}=30V, f=1MHz		1500		pF
Output Capacitance	Coss	V_{DS}=30V, f=1MHz		250		pF
Reverse Transfer Capacitance	Crss	V_{DS}=30V, f=1MHz		87		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		27		ns
Rise Time	t_r	See specified Test Circuit.		72		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		260		ns
Fall Time	t_f	See specified Test Circuit.		77		ns
Total Gate Charge	Qg	V_{DS}=200V, V_{GS}=10V, I_D=12A		75		nC
Gate-to-Source Charge	Qgs	V_{DS}=200V, V_{GS}=10V, I_D=12A		12		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=200V, V_{GS}=10V, I_D=12A		38		nC
Diode Forward Voltage	V_{SD}	I_S=12A, V_{GS}=0V		0.85	1.2	V

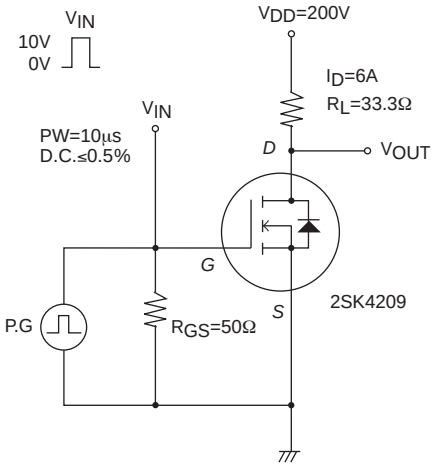
Package Dimensions

unit : mm (typ)

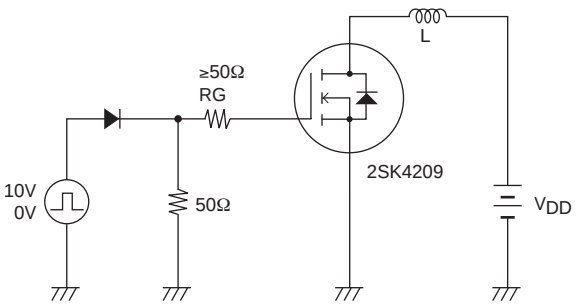
7503-004

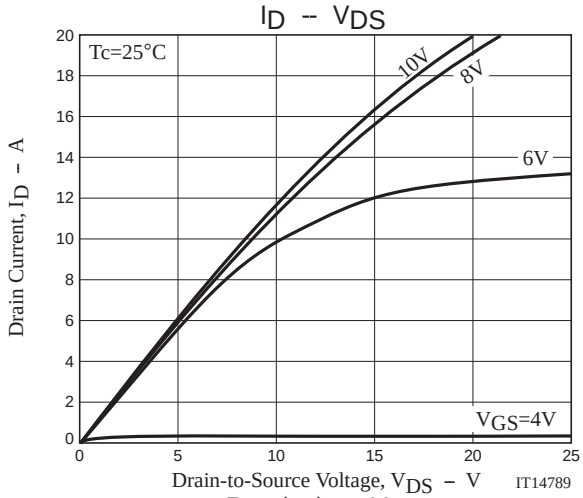


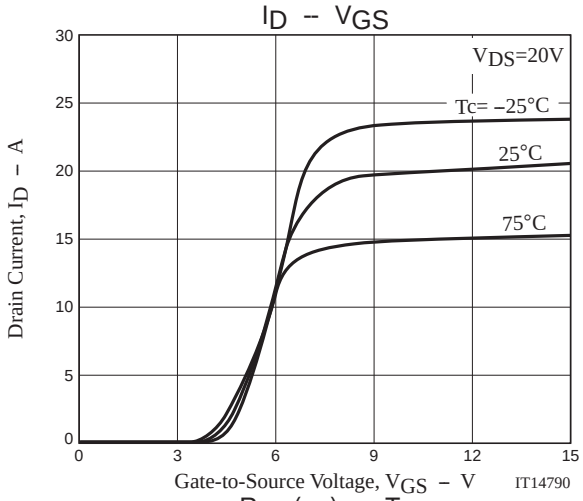
Switching Time Test Circuit

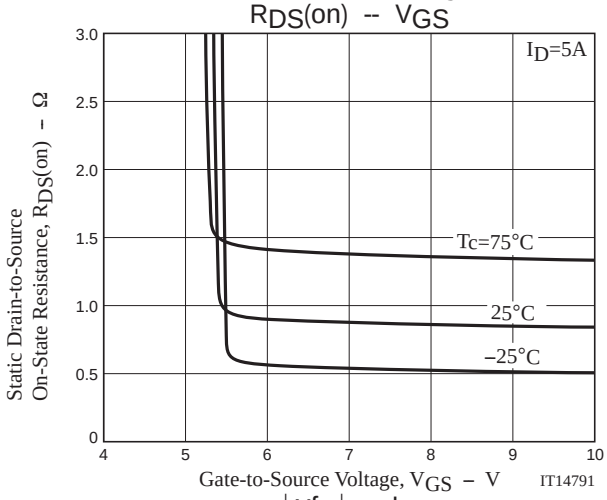


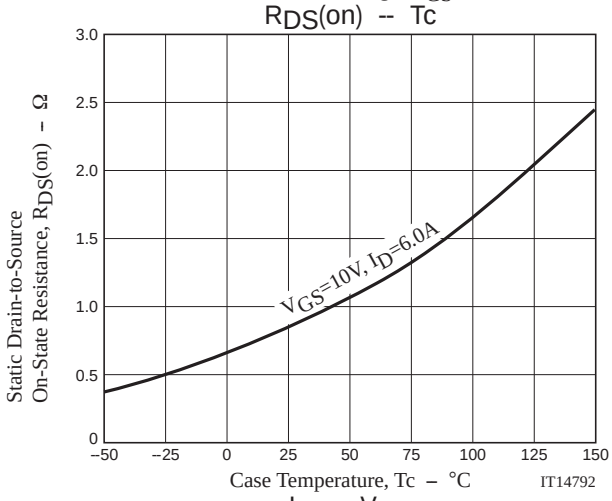
Avalanche Resistance Test Circuit

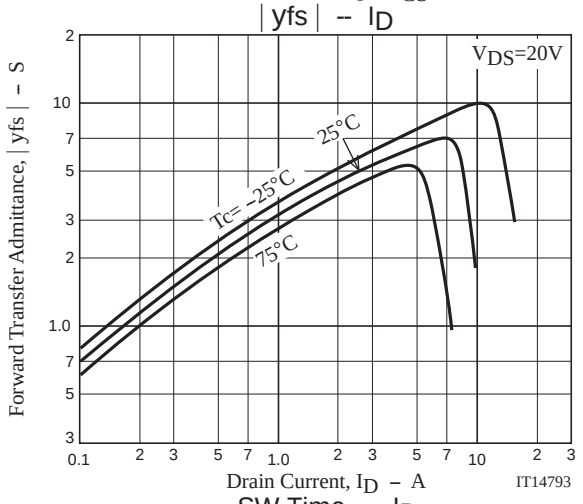


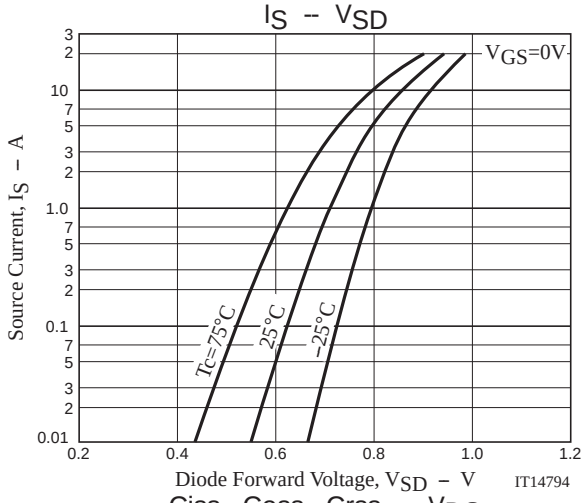

ID -- VDS
Tc=25°C
10V
8V
6V
VGS=4V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT14789

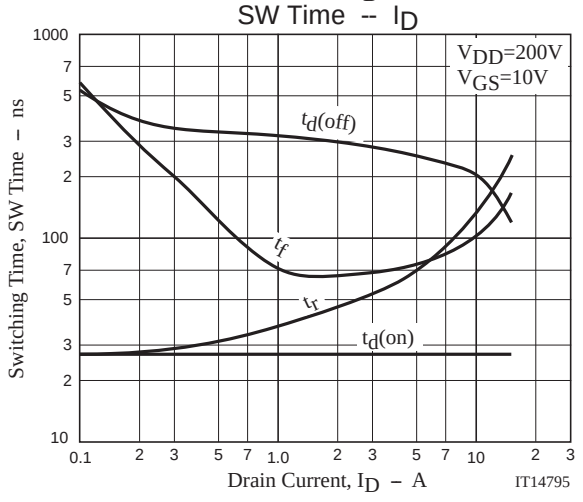

ID -- VGS
VDS=20V
Tc= –25°C
25°C
75°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT14790

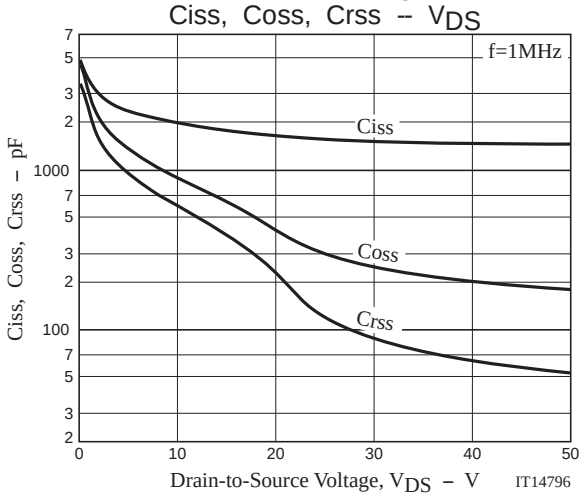

RDS(on) -- VGS
ID=5A
Tc=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V
IT14791

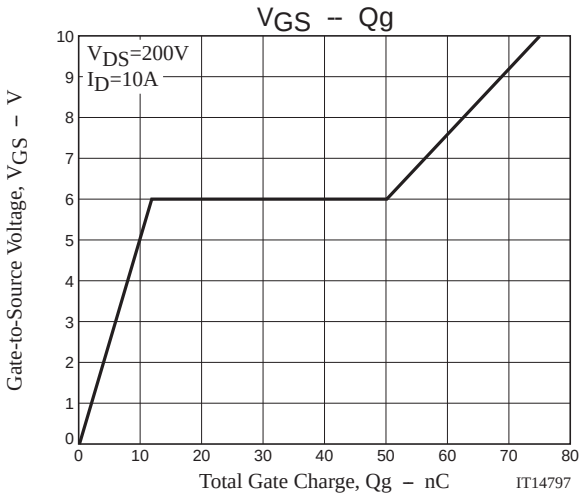

RDS(on) -- Tc
VGS=10V, ID=6.0A
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Case Temperature, Tc – °C
IT14792

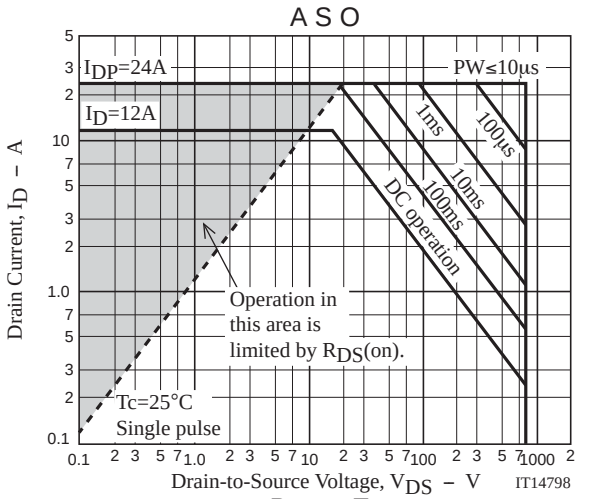

| yfs | -- ID
VDS=20V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT14793

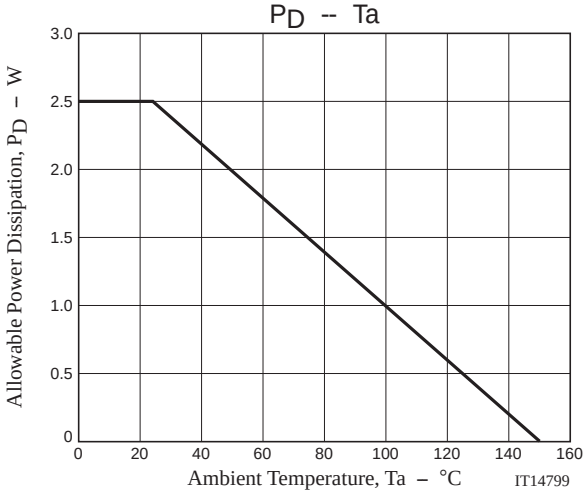

IS -- VSD
VGS=0V
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT14794

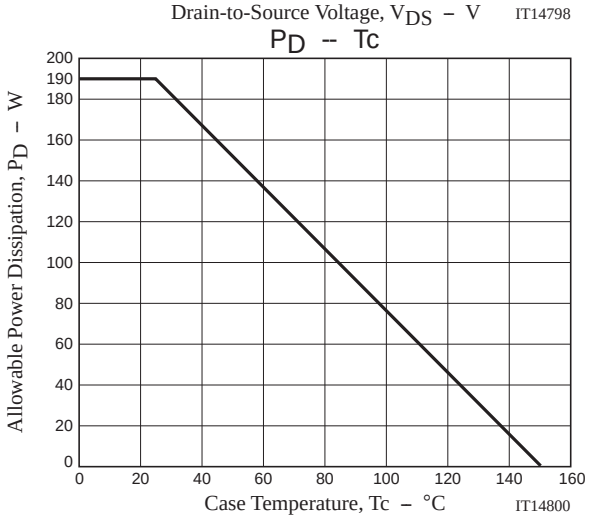

SW Time -- ID
VDD=200V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT14795

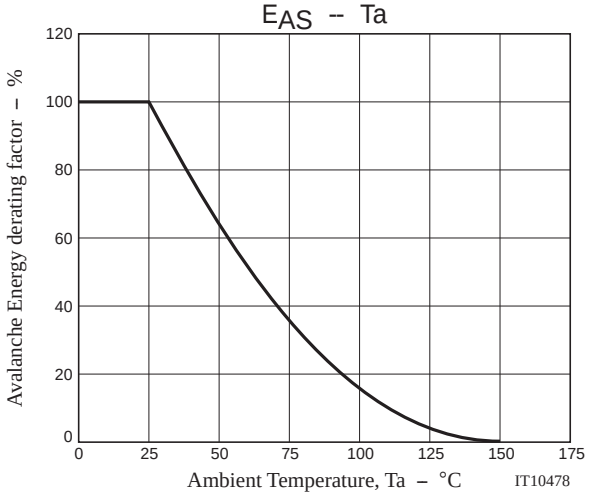

Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT14796


VGS – Qg
VDS=200V
ID=10A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT14797


A S O
IDP=24A
ID=12A
PW≤10μs
1ms
100μs
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
IT14798


PD -- Ta
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT14799


PD -- Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
IT14800


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

Note on usage : Since the 2SK4209 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

This catalog provides information as of October, 2009. Specifications and information herein are subject to change without notice.