Ordering number:EN4224

N-Channel Silicon MOSFET

2SK1691

Ultrahigh-Speed Switching Applications

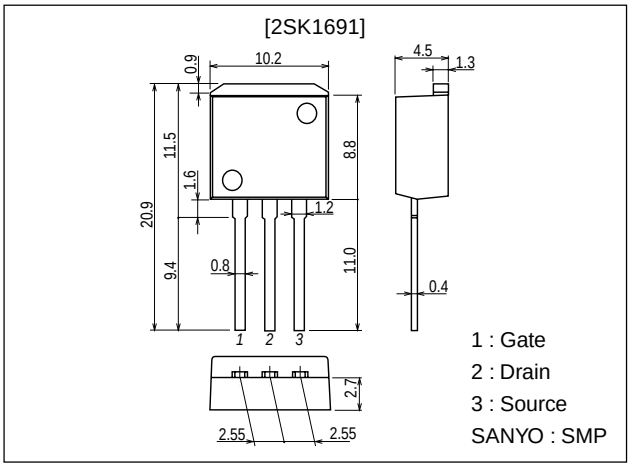
Features

- Low ON resistance.
- Ultrahigh-speed switching.

Package Dimensions

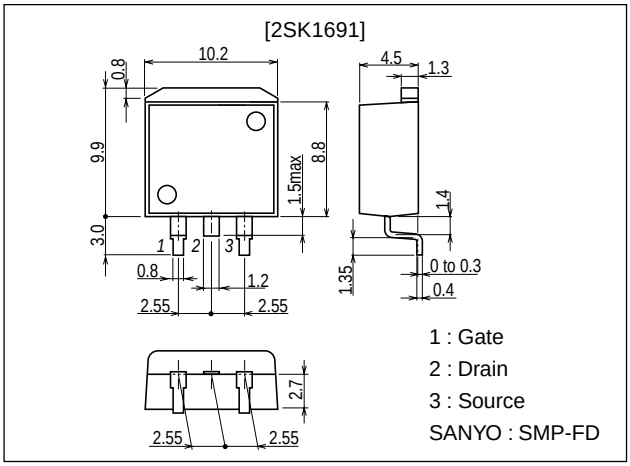
unit:mm

2093A



unit:mm

2090A



SANYO Electric Co.,Ltd. Semiconductor Company

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

Specifications

Absolute Maximum Ratings at Ta = 25˚C

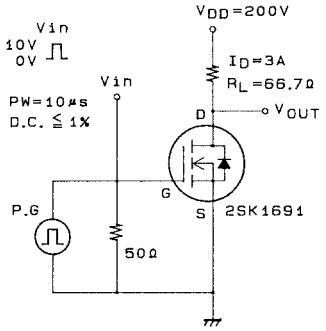
Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		450	V
Gate-to-Source Voltage	V_{GSS}		±30	V
Drain Current (DC)	I_D		5	A
Drain Current (pulse)	I_{DP}		20	A
Allowable Power Dissipation	P_D		1.65	W
		Tc=25°C	60	W
Channel Temperature	Tch		150	˚C
Storage Temperature	Tstg		–55 to +150	˚C

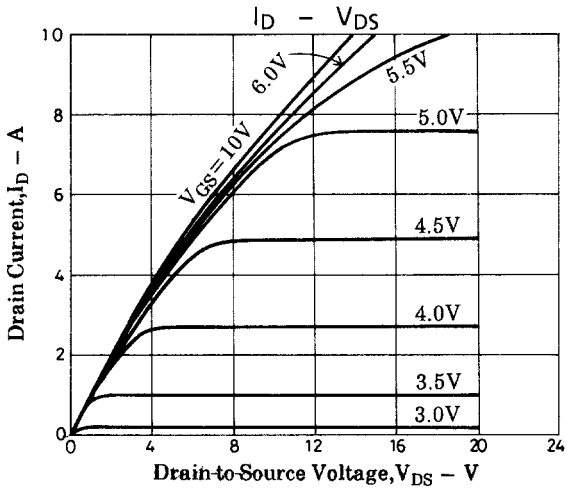
Electrical Characteristics at Ta = 25˚C

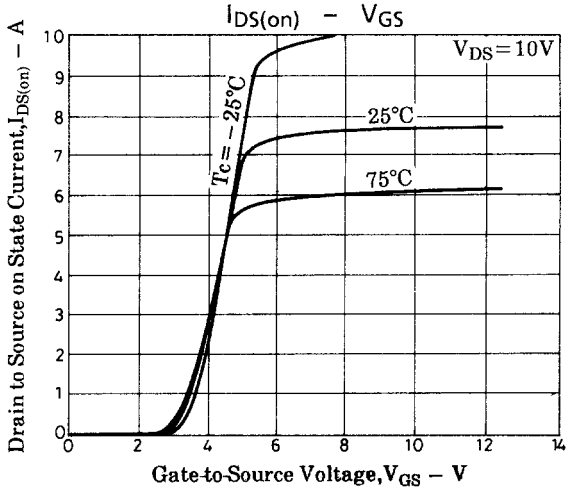
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0	450			V
Zero-Gate Votlage Drain Current	I_{DSS}	V_{DS}=450V, V_{GS}=0			1.0	mA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±30V, V_{DS}=0			±100	nA
Cutoff Voltage	$V_{GS(off)}$	V_{DS}=10V, I_D=1mA	2.0		3.0	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=3A	2.0	4.0		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)}$	I_D=3A, V_{GS}=10V		1.0	1.4	Ω
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		700		pF
Output Capacitance	Coss	V_{DS}=20V, f=1MHz		100		pF
Reverse Transfer Capacitance	Crss	V_{DS}=20V, f=1MHz		40		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit		15		ns
Rise Time	t_r	See specified Test Circuit		30		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit		130		ns
Fall Time	t_f	See specified Test Circuit		45		ns
Diode Forward Voltage	V_{SD}	I_S=3A, V_{GS}=0			1.8	V

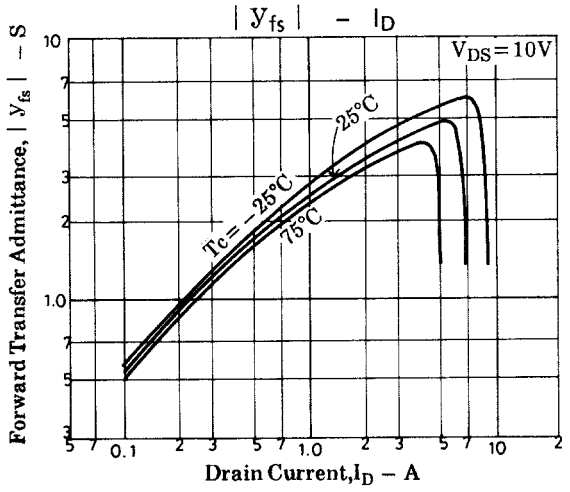
(Note) Be careful in handling the 2SK1691 because it has no protection diode between gate and source.

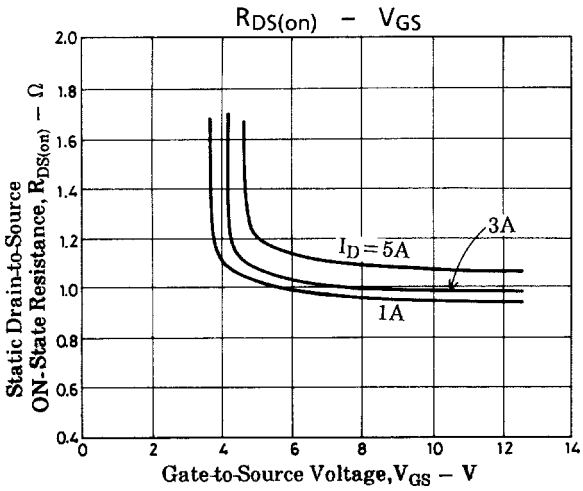
Switching Time Test Circuit

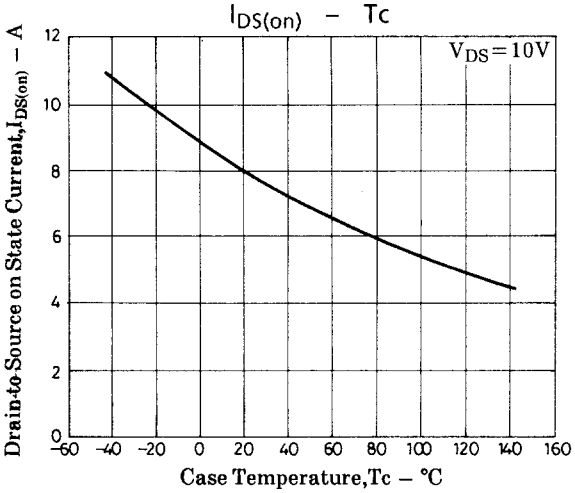


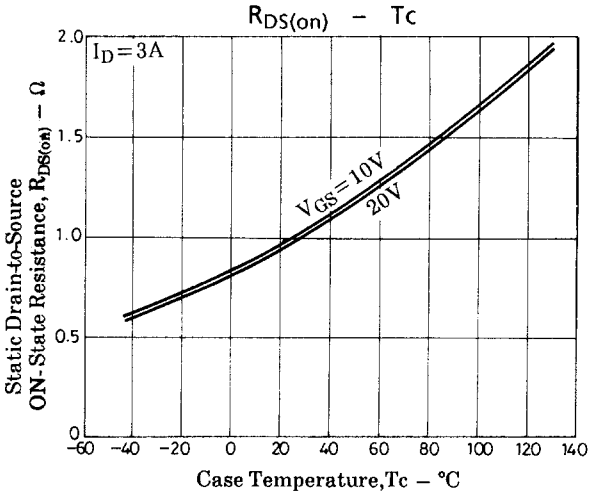


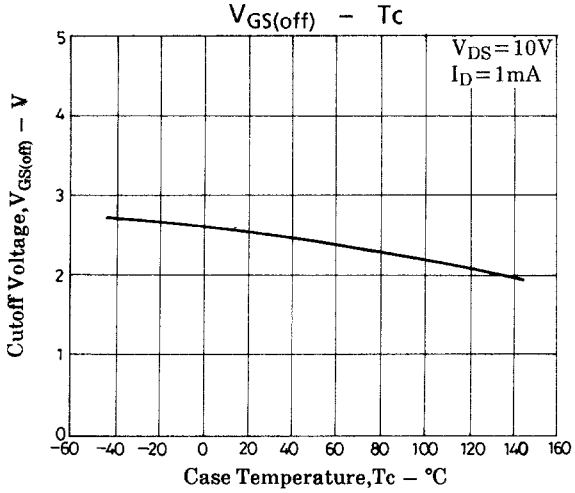


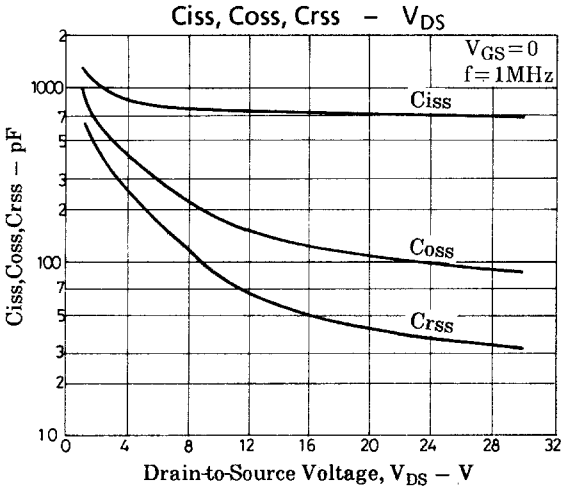

| yfs | – ID
VDS=10V
25°C
Tc=–25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A

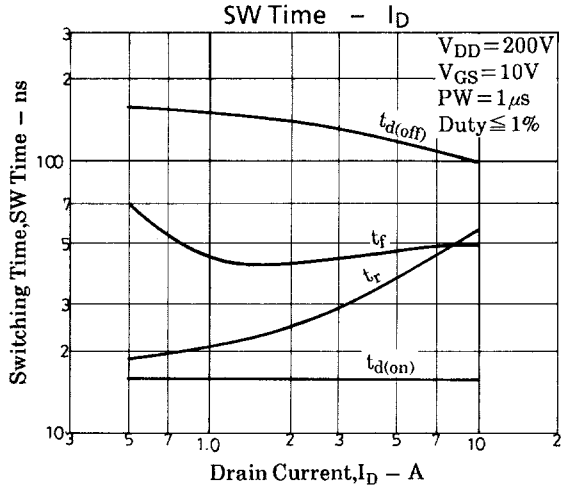

RDS(on) – VGS
ID=5A
3A
1A
Static Drain-to-Source ON-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V

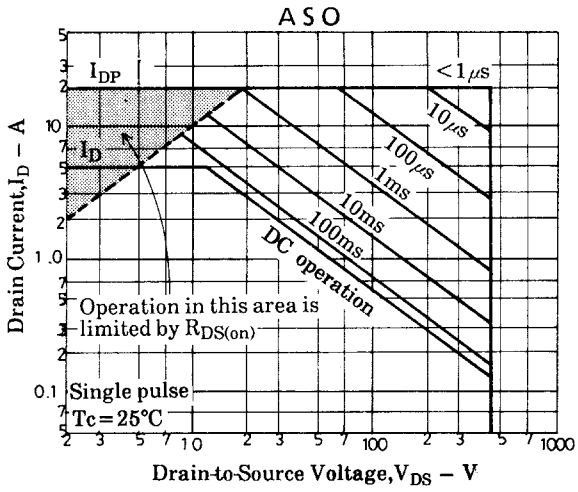

IDS(on) – Tc
VDS=10V
Drain-to-Source on State Current, IDS(on) – A
Case Temperature, Tc – °C


RDS(on) – Tc
ID=3A
VGS=10V
20V
Static Drain-to-Source ON-State Resistance, RDS(on) – Ω
Case Temperature, Tc – °C


VGS(off) – Tc
VDS=10V
ID=1mA
Cutoff Voltage, VGS(off) – V
Case Temperature, Tc – °C


Ciss, Coss, Crss – VDS
VGS=0
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V


SW Time – ID
VDD=200V
VGS=10V
PW=1μs
Duty≦1%
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A


ASO
IDP
ID
<1μs
10μs
100μs
1ms
10ms
100ms
DC operation
Operation in this area is limited by RDS(on)
Single pulse
Tc=25°C
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V