

N-Channel Silicon MOSFET



**2SK1690**

**Ultrahigh-Speed Switching Applications**

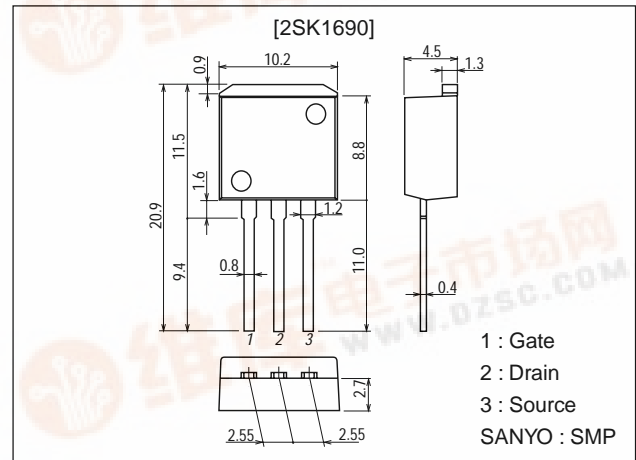
**Features**

- Low ON resistance.
- Ultrahigh-speed switching.

**Package Dimensions**

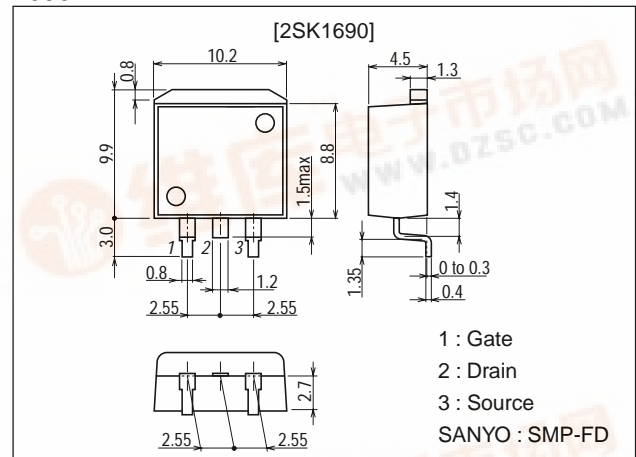
unit:mm

2093A



unit:mm

2090A



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# 2SK1690

## Specifications

### Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

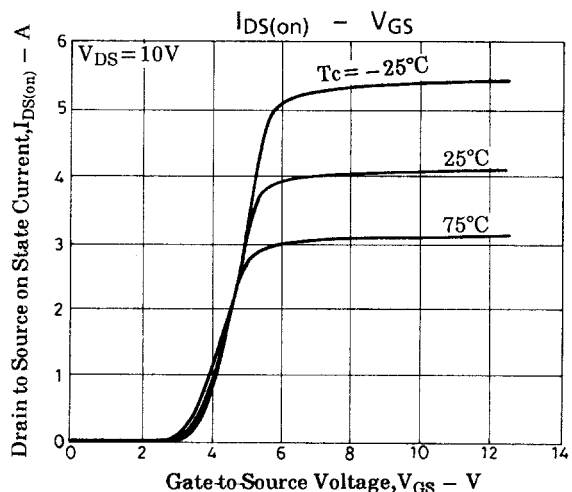
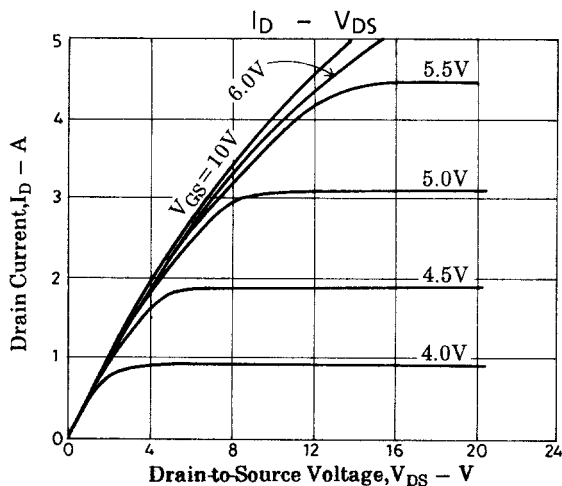
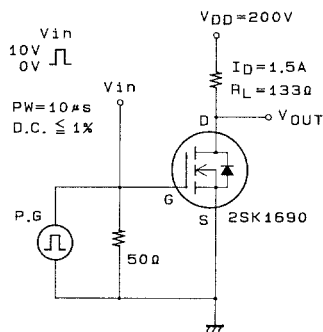
Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	$V_{DSS}$		450	V
Gate-to-Source Voltage	$V_{GSS}$		$\pm 30$	V
Drain Current (DC)	$I_D$		3	A
Drain Current (pulse)	$I_{DP}$		12	A
Allowable Power Dissipation	$P_D$	$T_c = 25^\circ\text{C}$	1.65	W
			50	W
Channel Temperature	$T_{ch}$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

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

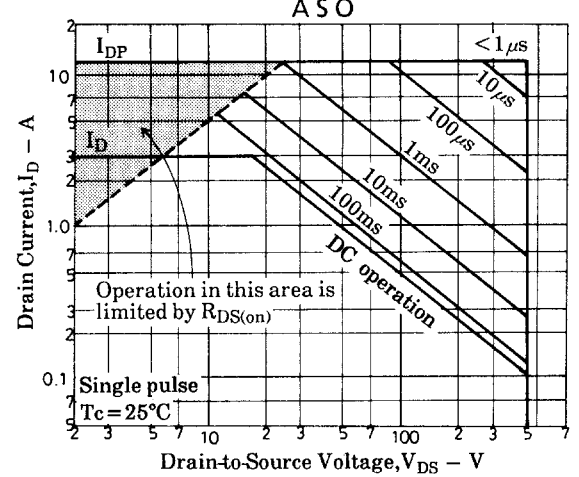
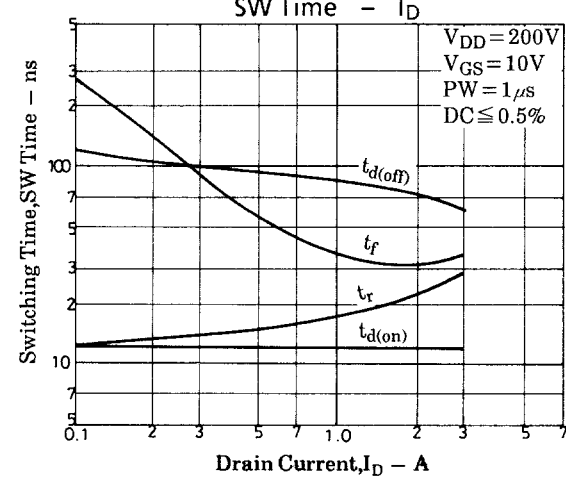
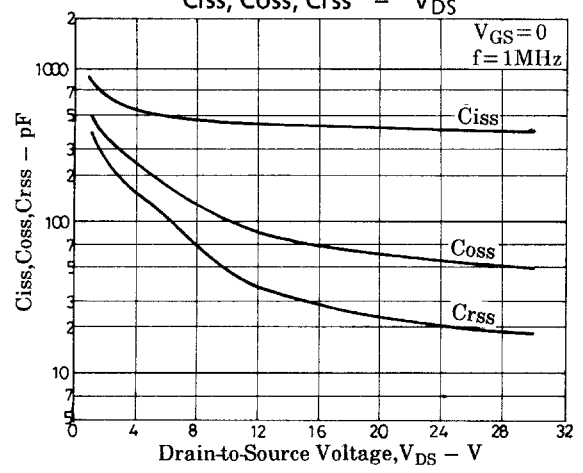
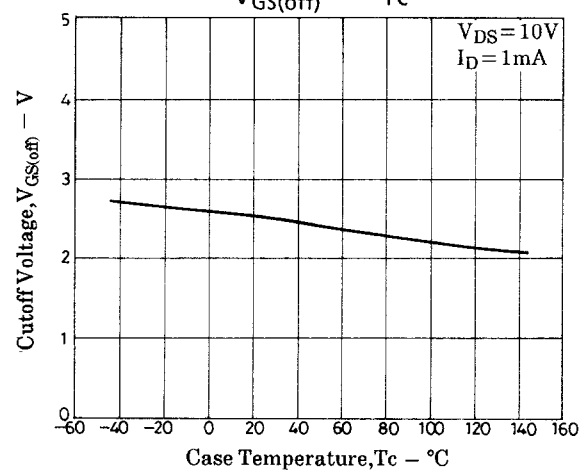
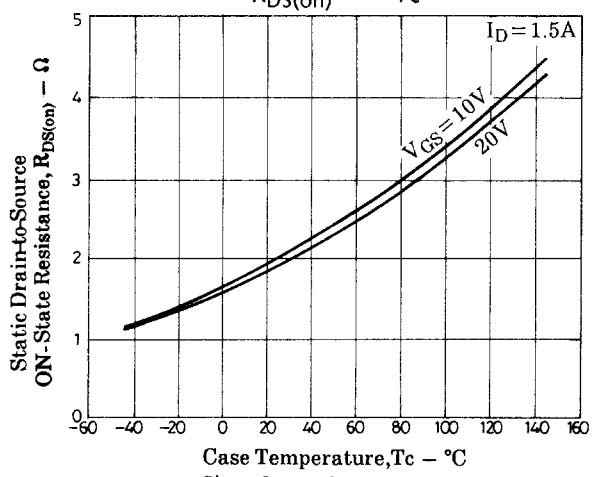
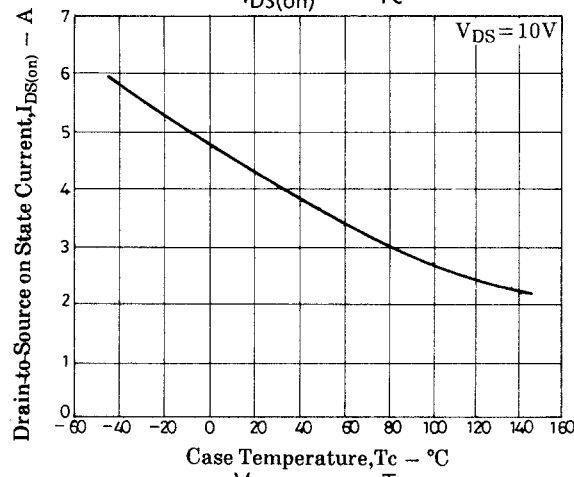
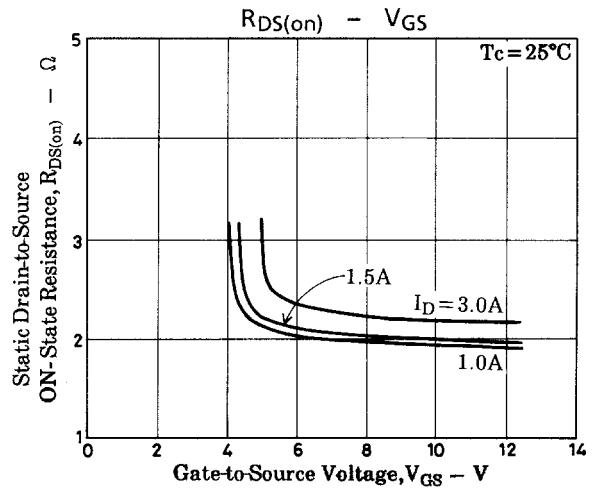
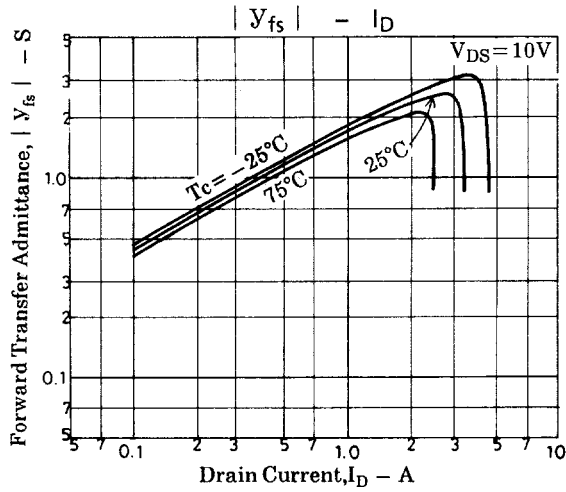
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 1\text{mA}, V_{GS} = 0$	450			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 450\text{V}, V_{GS} = 0$			1.0	mA
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 30\text{V}, V_{DS} = 0$			$\pm 100$	nA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS} = 10\text{V}, I_D = 1\text{mA}$	2.0		3.0	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS} = 10\text{V}, I_D = 1.5\text{A}$	1.1	2.2		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)}$	$I_D = 1.5\text{A}, V_{GS} = 10\text{V}$		2.0	2.6	$\Omega$
Input Capacitance	$C_{iss}$	$V_{DS} = 20\text{V}, f = 1\text{MHz}$		400		pF
Output Capacitance	$C_{oss}$	$V_{DS} = 20\text{V}, f = 1\text{MHz}$		60		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS} = 20\text{V}, f = 1\text{MHz}$		25		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		80		ns
Fall Time	$t_f$	See specified Test Circuit		35		ns
Diode Forward Voltage	$V_{SD}$	$I_S = 3\text{A}, V_{GS} = 0$			1.8	V

(Note) Be careful in handling the 2SK1690 because it has no protection diode between gate and source.

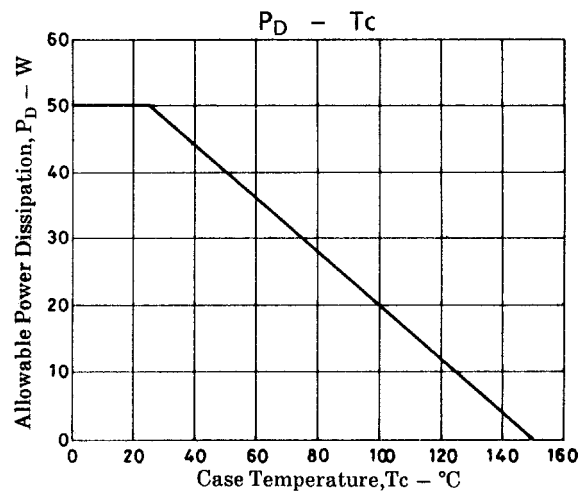
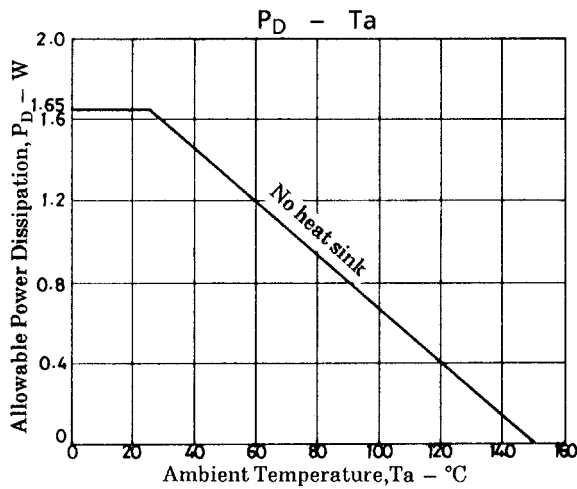
### Switching Time Test Circuit



# 2SK1690



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