



# 2SJ684 — P-Channel Silicon MOSFET

## General-Purpose Switching Device Applications

### Features

- Low ON-resistance.
- Load S/W Applications.
- Avalanche resistance guarantee.

### Specifications

#### Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V <sub>DSS</sub>		-100	V
Gate-to-Source Voltage	V <sub>GSS</sub>		±20	V
Drain Current (DC)	I <sub>D</sub>		-45	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycles≤1%	-180	A
Allowable Power Dissipation	P <sub>D</sub>	Tc=25°C	50	W
Channel Temperature	T <sub>ch</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C
Avalanche Energy (Single Pulse) *1	E <sub>AS</sub>		70	mJ
Avalanche Current *2	I <sub>AV</sub>		-45	A

Note : \*1 V<sub>DD</sub>=-30V, L=50μH, I<sub>AV</sub>=-45A

\*2 L≤50μH, Single pulse

#### Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> =-1mA, V <sub>GS</sub> =0V	-100			V
Zero-Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-100V, V <sub>GS</sub> =0V			-1	μA
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±16V, V <sub>DS</sub> =0V			±10	μA

Marking : J684

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# 2SJ684

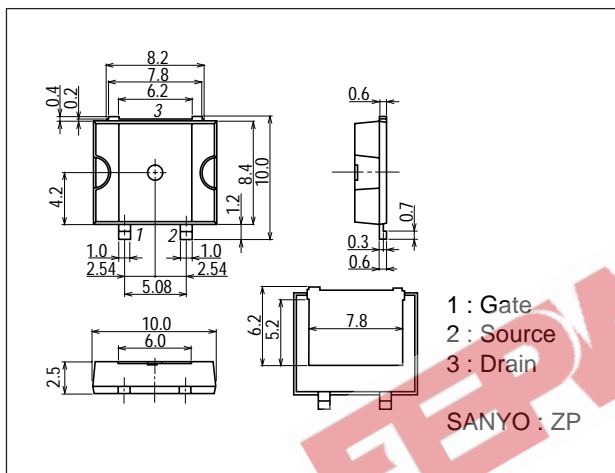
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=-10V, I_D=-1mA$	-1.2		-2.6	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=-10V, I_D=-23A$	32	53		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=-23A, V_{GS}=-10V$		18.5	24	$m\Omega$
	$R_{DS(on)2}$	$I_D=-23A, V_{GS}=-4V$		22	31	$m\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=-20V, f=1MHz$		14500		pF
Output Capacitance	$C_{oss}$	$V_{DS}=-20V, f=1MHz$		700		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS}=-20V, f=1MHz$		550		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		110		ns
Rise Time	$t_r$	See specified Test Circuit.		270		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		1020		ns
Fall Time	$t_f$	See specified Test Circuit.		400		ns
Total Gate Charge	$Q_g$	$V_{DS}=-50V, V_{GS}=-10V, I_D=-45A$		270		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=-50V, V_{GS}=-10V, I_D=-45A$		40		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$	$V_{DS}=-50V, V_{GS}=-10V, I_D=-45A$		60		nC
Diode Forward Voltage	$V_{SD}$	$I_S=-45A, V_{GS}=0V$		-0.9	-1.5	V

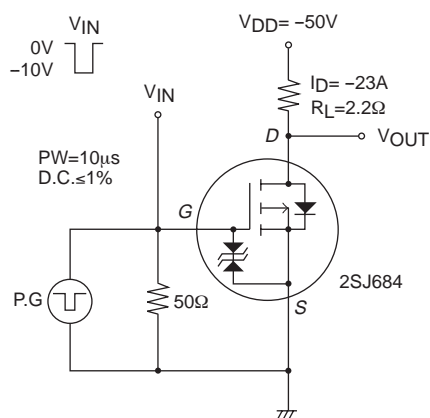
## Package Dimensions

unit : mm (typ)

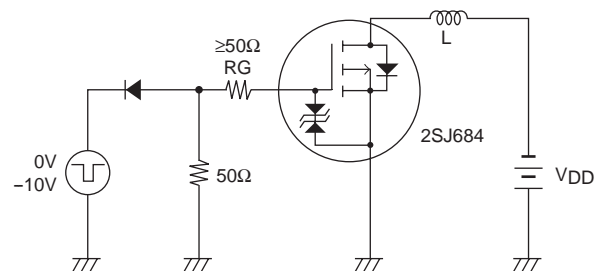
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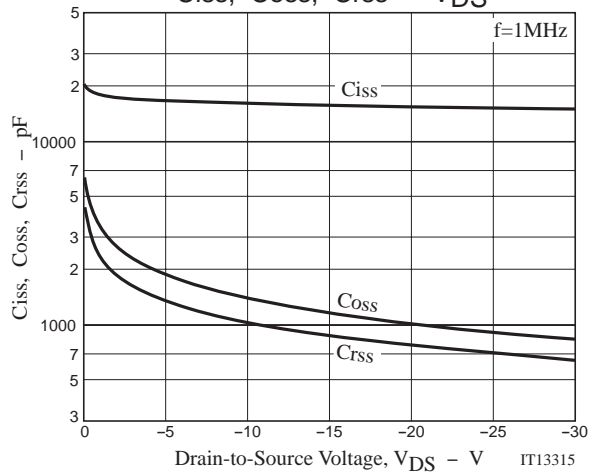
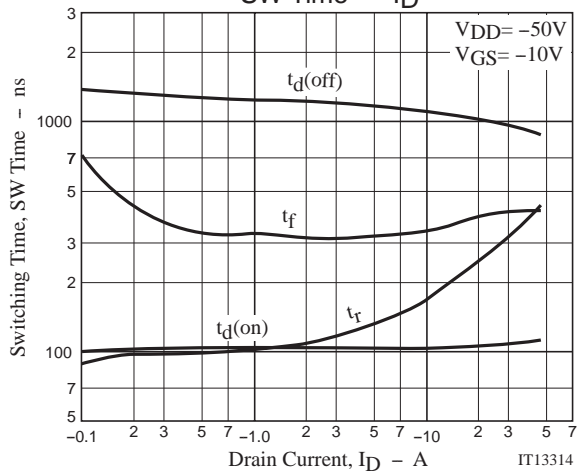
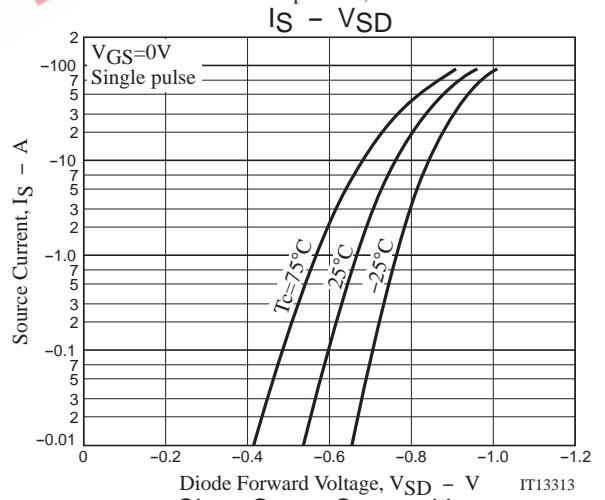
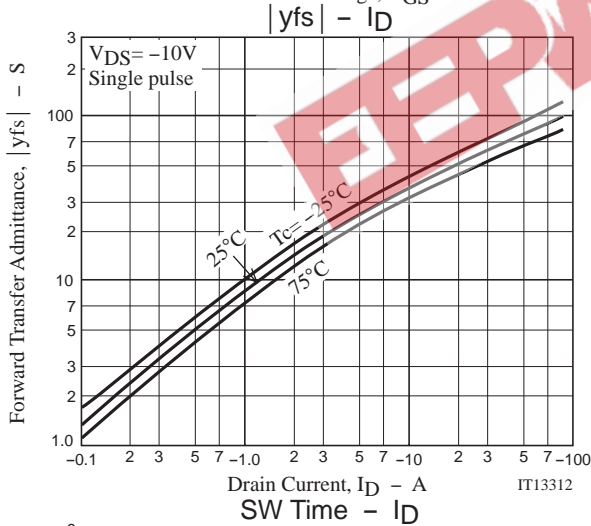
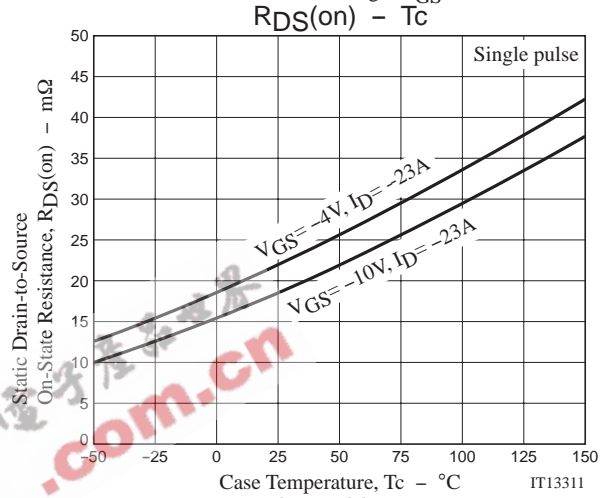
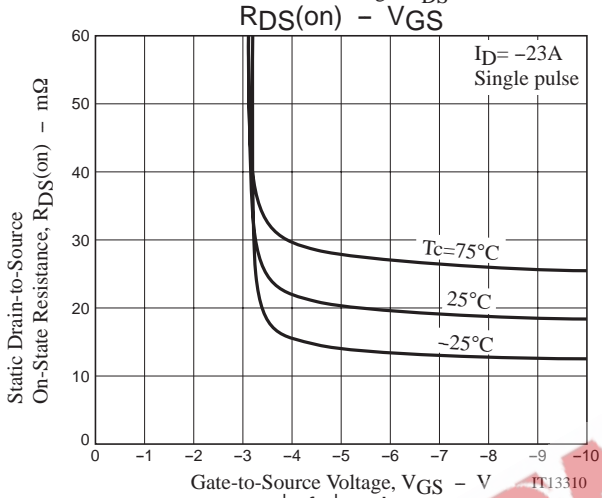
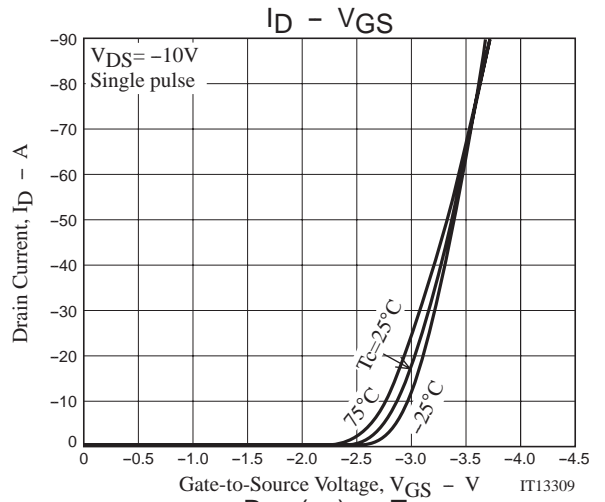
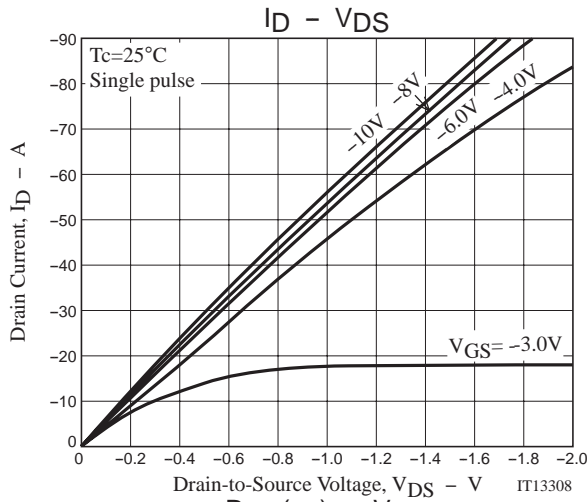


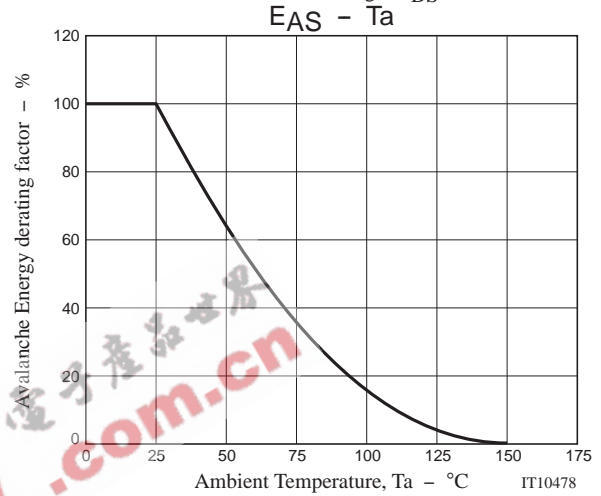
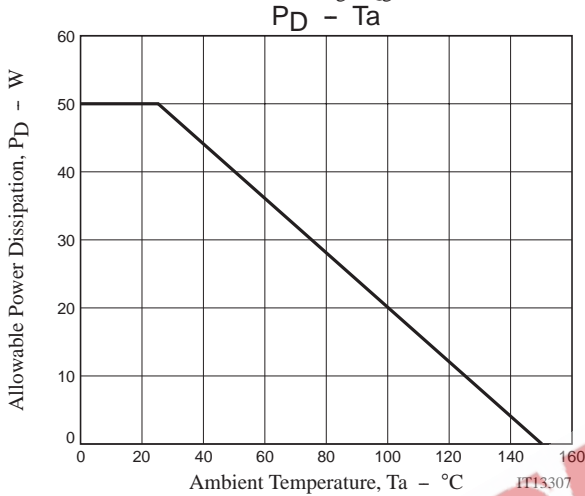
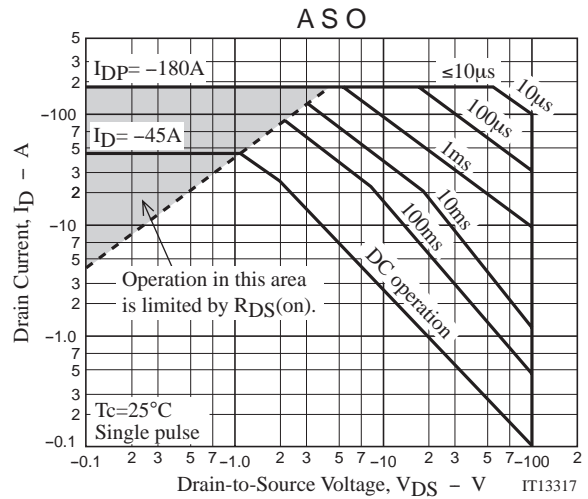
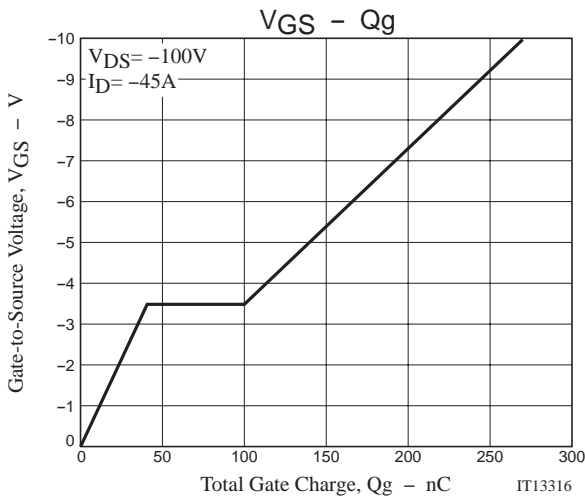
## Switching Time Test Circuit



## Avalanche Resistance Test Circuit







Note on usage : Since the 2SJ684 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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