



SANYO Semiconductors

DATA SHEET

2SK4089LS — N-Channel Silicon MOSFET

General-Purpose Switching Device Applications

Features

- Low ON-resistance, low input capacitance, ultrahigh-speed switching.
- High reliability (Adoption of HVP process).
- Attachment workability is good by Mica-less package.
- Avalanche resistance guarantee.

Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		650	V
Gate-to-Source Voltage	V_{GSS}		± 30	V
Drain Current (DC)	I_{DC}^{*1}	Limited only by maximum temperature	12	A
	I_{Dpack}^{*2}	$T_c=25^\circ\text{C}$ (SANYO's ideal heat dissipation condition)*3	8.5	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	48	A
Allowable Power Dissipation	P_D		2.0	W
		$T_c=25^\circ\text{C}$ (SANYO's ideal heat dissipation condition)*3	40	W
Channel Temperature	T_{ch}		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$
Avalanche Energy (Single Pulse) *4	E_{AS}		84	mJ
Avalanche Current *5	I_{AV}		12	A

*1 Shows chip capability

*2 Package limited

*3 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.

*4 $V_{DD}=99\text{V}$, $L=1\text{mH}$, $I_{AV}=12\text{A}$

*5 $L \leq 1\text{mH}$, single pulse

Marking : K4089

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2SK4089LS

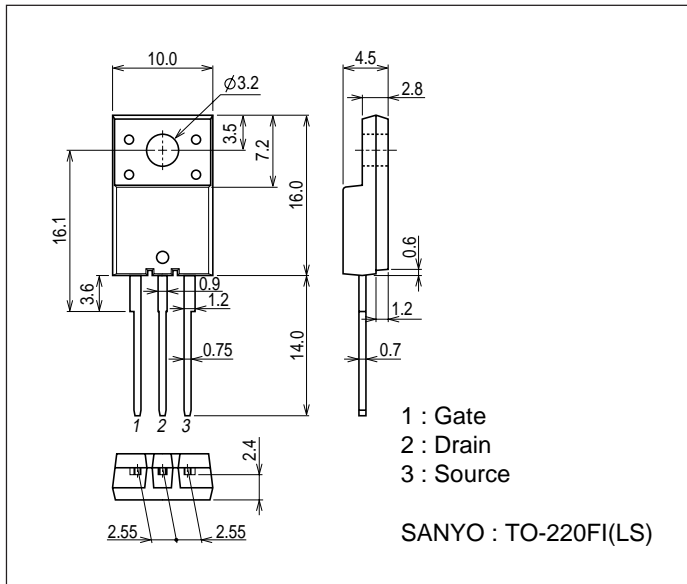
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=10mA, V_{GS}=0V$	650			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=520V, V_{GS}=0V$			100	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$			± 100	nA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10V, I_D=1mA$	3		5	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10V, I_D=6A$	3.8	7.5		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)}$	$I_D=6A, V_{GS}=10V$		0.55	0.72	Ω
Input Capacitance	C_{iss}	$V_{DS}=30V, f=1MHz$		1200		pF
Output Capacitance	C_{oss}	$V_{DS}=30V, f=1MHz$		208		pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=30V, f=1MHz$		44		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		27		ns
Rise Time	t_r	See specified Test Circuit.		66		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit.		140		ns
Fall Time	t_f	See specified Test Circuit.		45		ns
Total Gate Charge	Q_g	$V_{DS}=200V, V_{GS}=10V, I_D=12A$		45.4		nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=200V, V_{GS}=10V, I_D=12A$		7.7		nC
Gate-to-Drain "Miller" Charge	Q_{gd}	$V_{DS}=200V, V_{GS}=10V, I_D=12A$		26.1		nC
Diode Forward Voltage	V_{SD}	$I_S=12A, V_{GS}=0V$		0.9	1.2	V

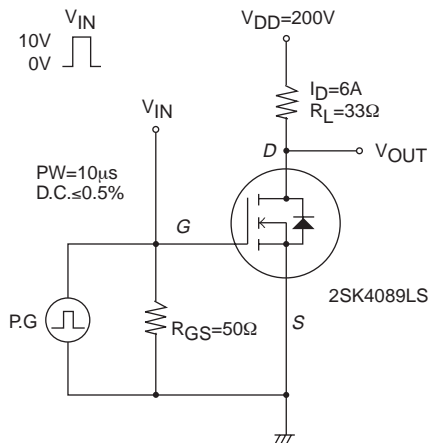
Package Dimensions

unit : mm (typ)

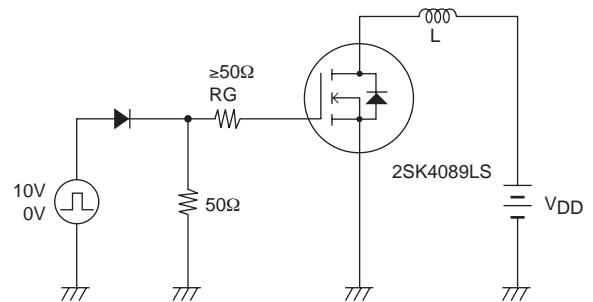
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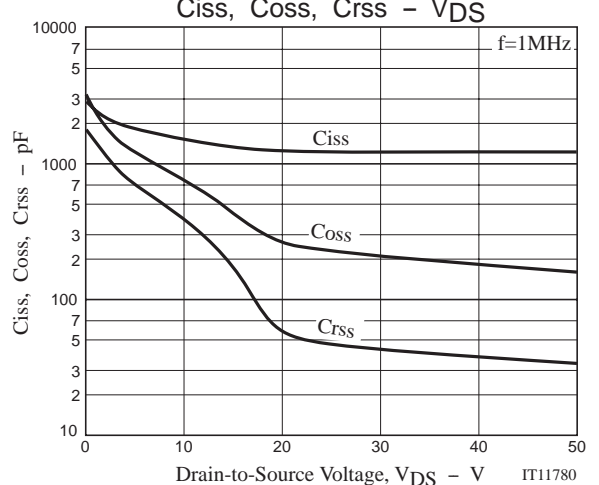
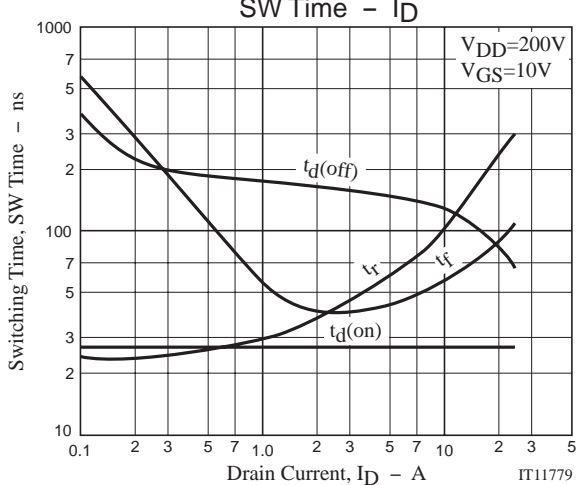
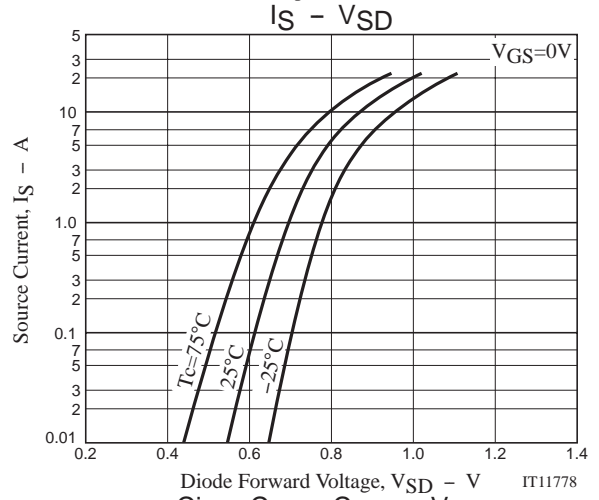
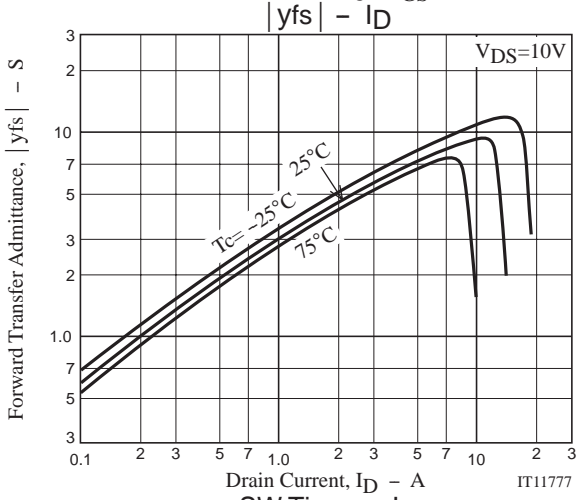
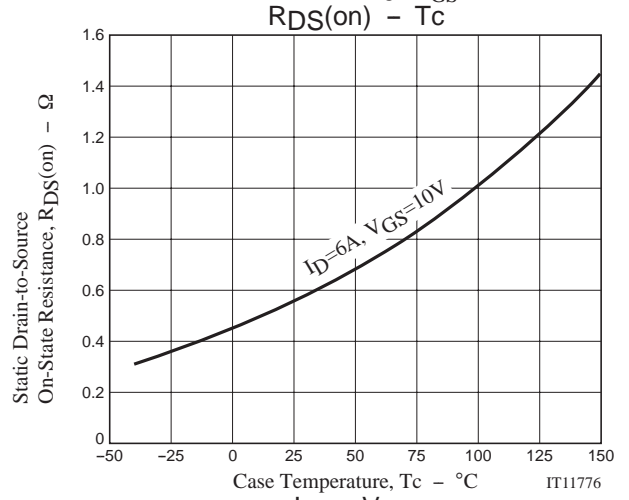
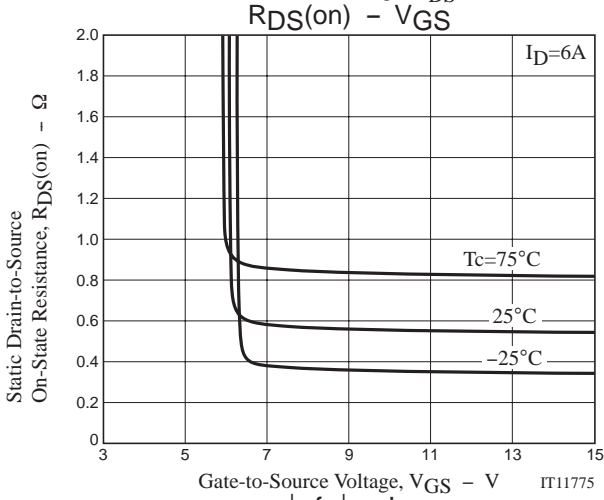
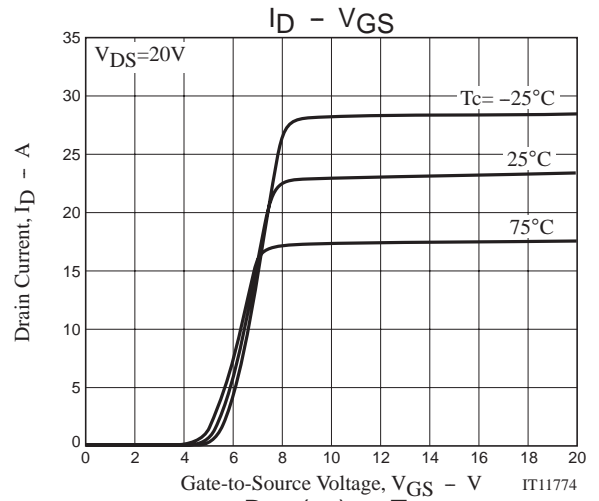
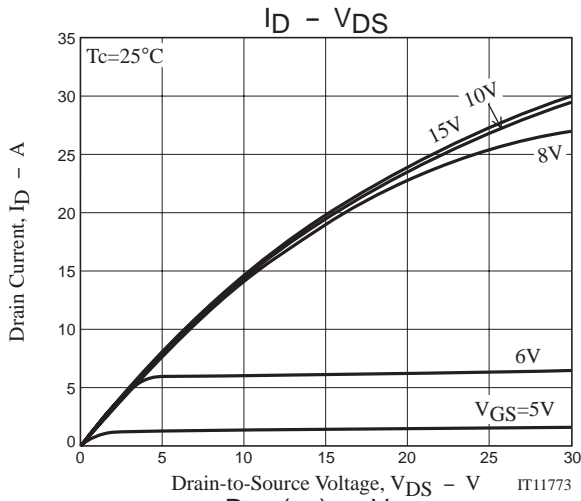
Switching Time Test Circuit



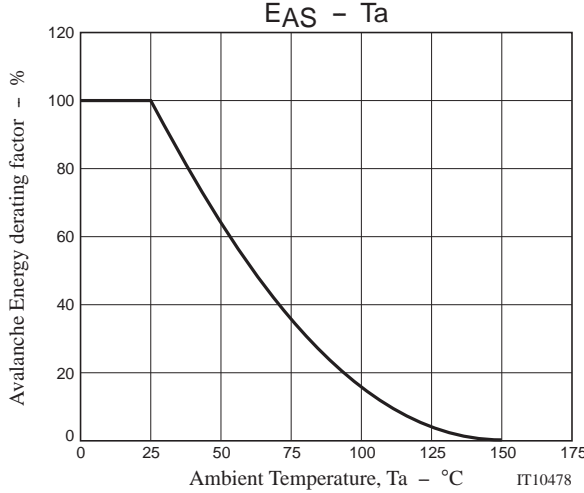
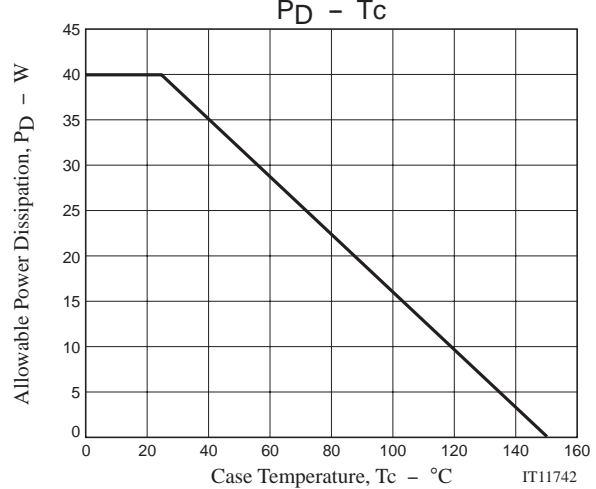
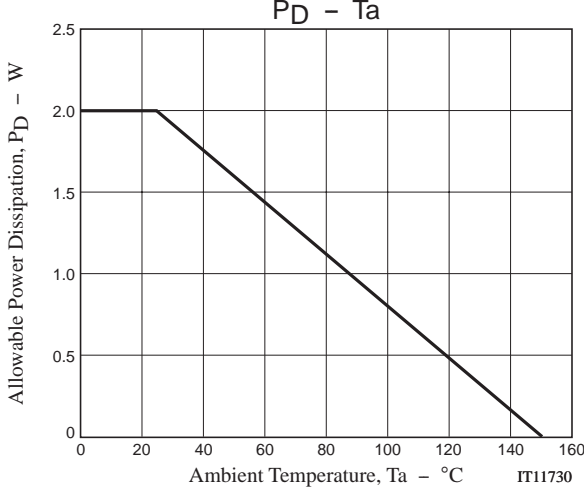
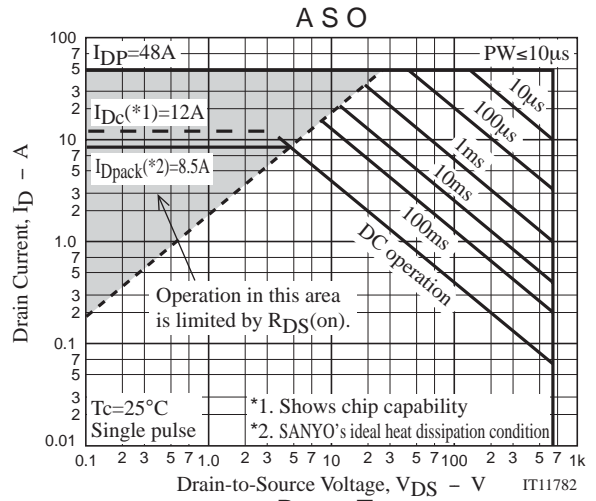
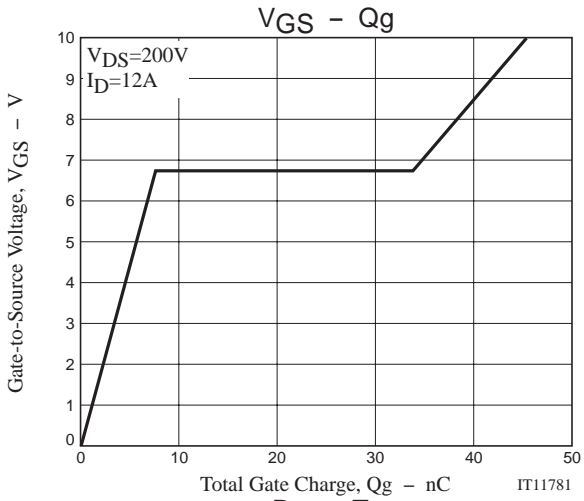
Avalanche Resistance Test Circuit



2SK4089LS



2SK4089LS





Note on usage : Since the 2SK4089LS is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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