Ordering number : ENA0777

SANYO Semiconductors

DATA SHEET

N-Channel Silicon MOSFET

2SK4099LS — General-Purpose Switching Device Applications

Features

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

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		600	V
Gate-to-Source Voltage	V_{GSS}		±30	V
Drain Current (DC)	I_{Dc}*1	Limited only by maximum temperature	8.5	A
	I_{Dpack}*2	SANYO's ideal heat dissipation condition	6.9	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	34	A
Allowable Power Dissipation	P_D		2.0	W
		Tc=25°C (SANYO's ideal heat dissipation condition)	35	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *3	E_{AS}		215	mJ
Avalanche Current *4	I_{AV}		8.5	A

*1 Shows chip capability

*2 Package limited

*3 V_{DD}=99V, L=5mH, I_{AV}=8.5A

*4 L≤5mH, single pulse

Marking : K4099

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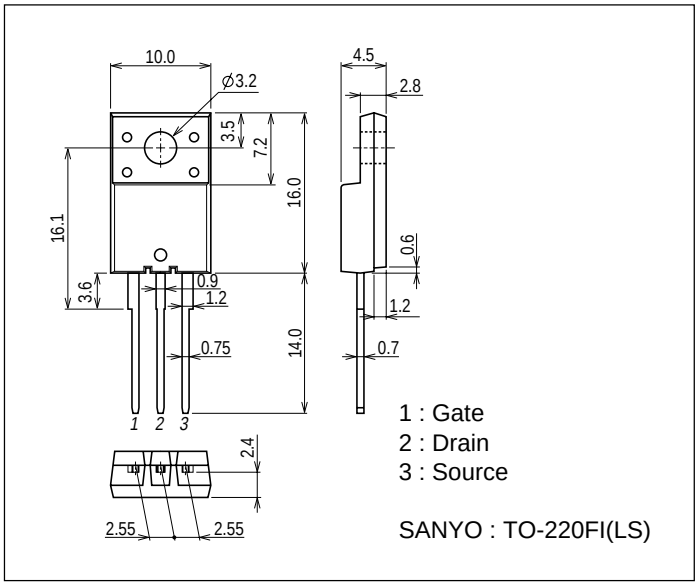
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=10mA, V_{GS}=0V	600			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=480V, V_{GS}=0V			100	μA
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	3		5	V
Forward Transfer Admittance	$\|yfs\|$	V_{DS}=10V, I_D=4A	2.7	5.4		S
Static Drain-to-Source On-State Resistance	$R_{DS}(on)$	I_D=4A, V_{GS}=10V		0.72	0.94	Ω
Input Capacitance	Ciss	V_{DS}=30V, f=1MHz		750		pF
Output Capacitance	Coss	V_{DS}=30V, f=1MHz		140		pF
Reverse Transfer Capacitance	Crss	V_{DS}=30V, f=1MHz		31		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		16		ns
Rise Time	t_r	See specified Test Circuit.		37		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit.		106		ns
Fall Time	t_f	See specified Test Circuit.		41		ns
Total Gate Charge	Qg	V_{DS}=200V, V_{GS}=10V, I_D=8.5A		29		nC
Gate-to-Source Charge	Qgs	V_{DS}=200V, V_{GS}=10V, I_D=8.5A		5.2		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=200V, V_{GS}=10V, I_D=8.5A		16.5		nC
Diode Forward Voltage	V_{SD}	I_S=8.5A, V_{GS}=0V		0.9	1.2	V

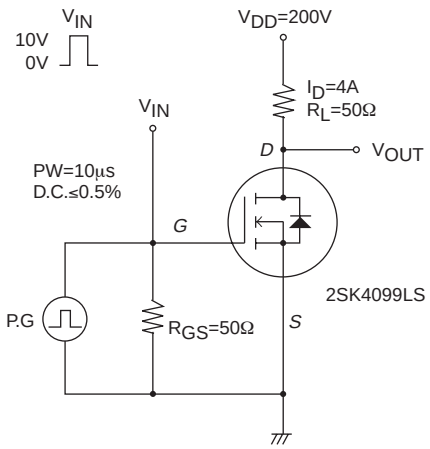
Package Dimensions

unit : mm (typ)

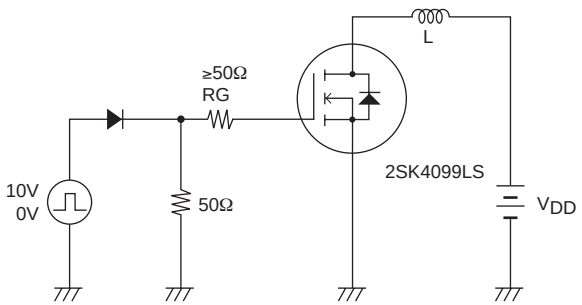
7509-002

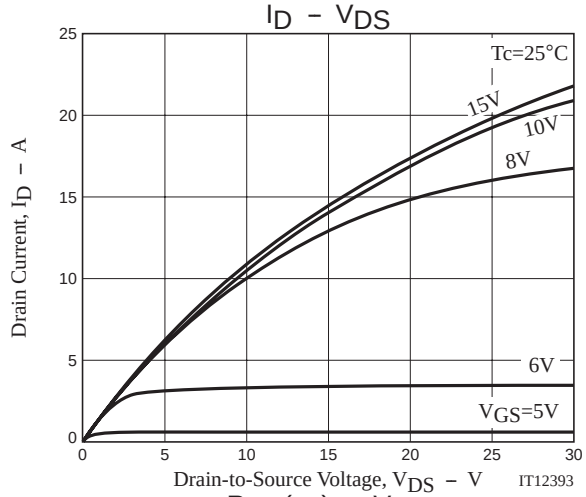


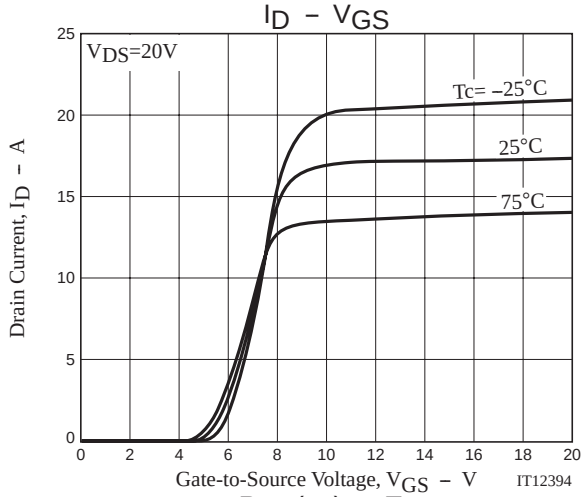
Switching Time Test Circuit

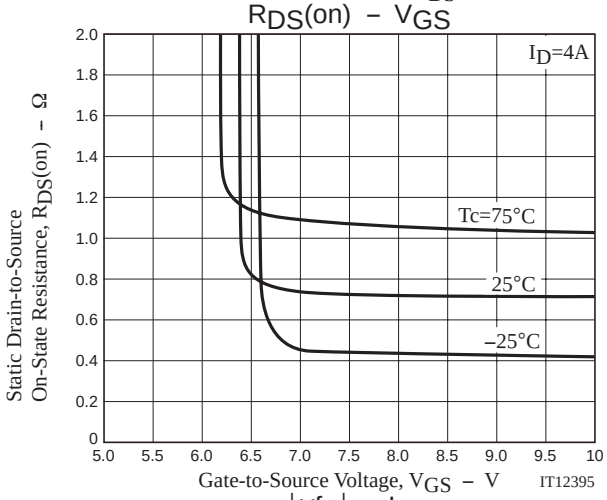


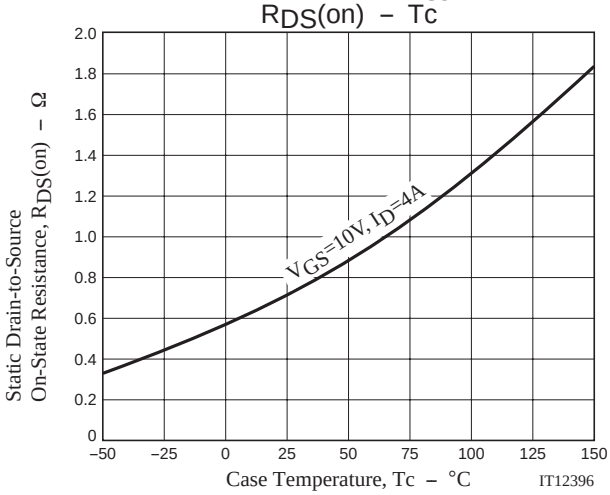
Avalanche Resistance Test Circuit

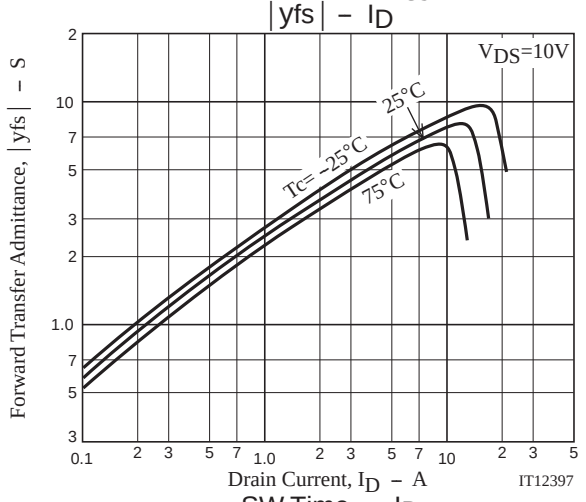


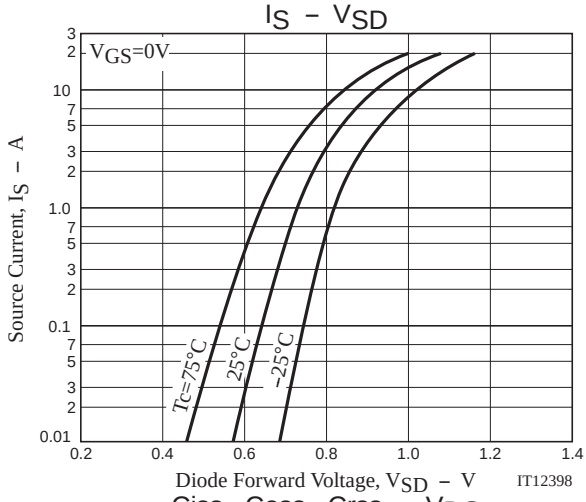

ID – VDS
Tc=25°C
15V
10V
8V
6V
VGS=5V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT12393

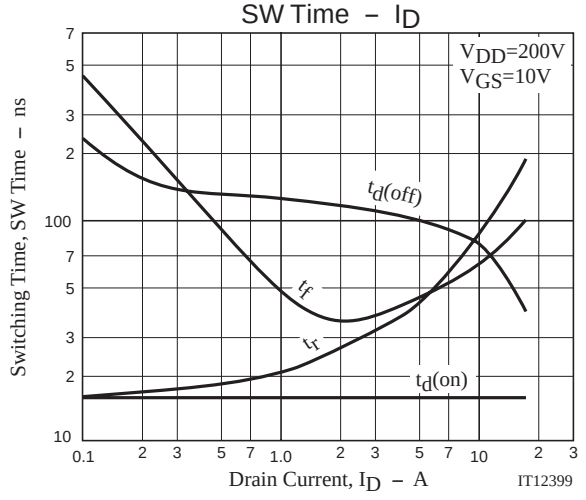

ID – VGS
VDS=20V
Tc= –25°C
25°C
75°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT12394

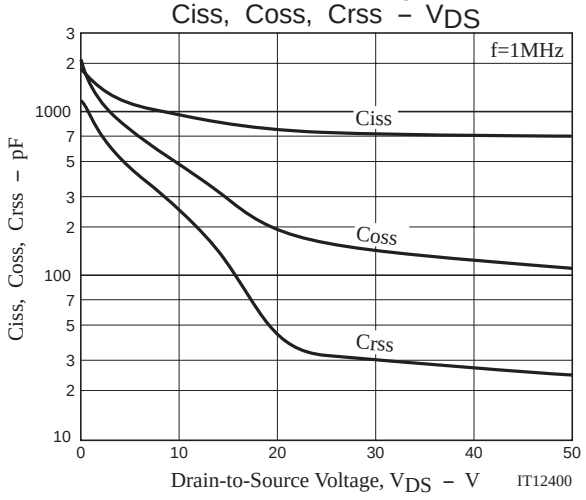

RDS(on) – VGS
ID=4A
Tc=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V
IT12395

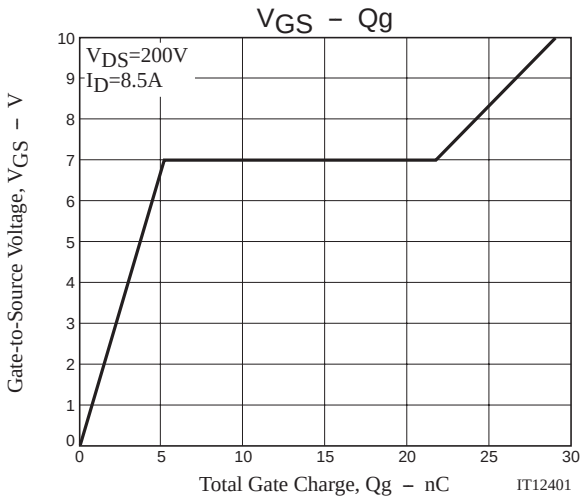

RDS(on) – Tc
VGS=10V, ID=4A
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Case Temperature, Tc – °C
IT12396

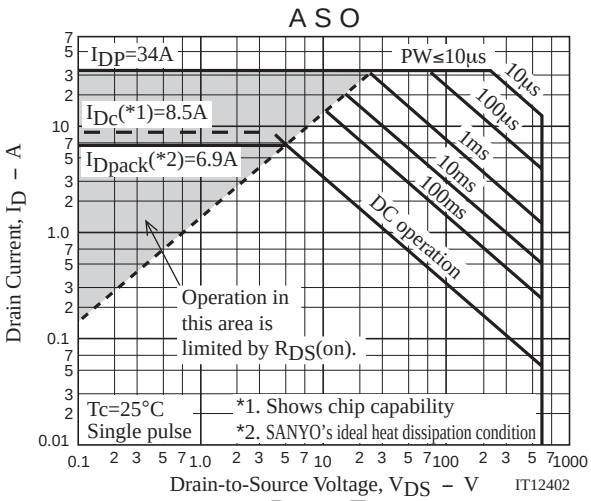

|yfs| – ID
VDS=10V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT12397

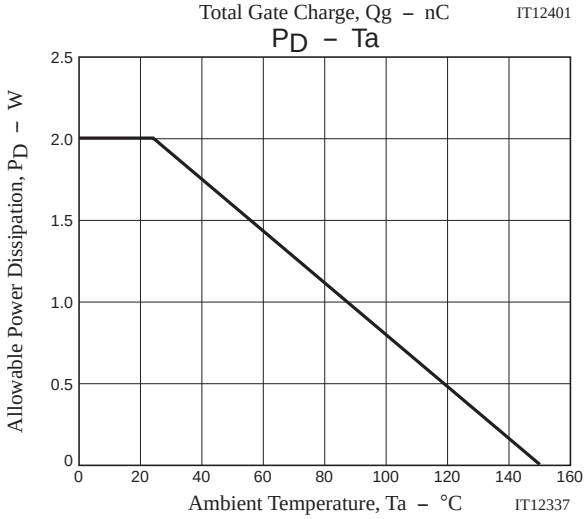

IS – VSD
VGS=0V
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT12398

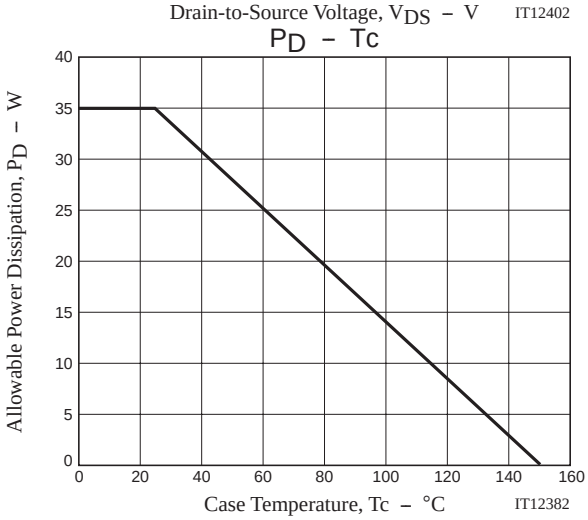

SW Time – ID
VDD=200V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT12399

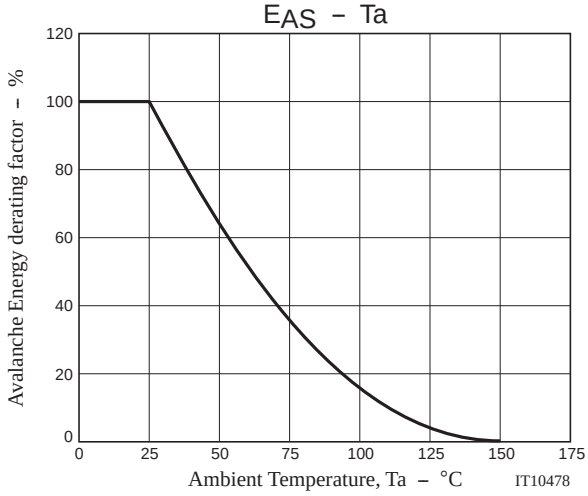

Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT12400


VGS – Qg
VDS=200V
ID=8.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT12401


A S O
IDP=34A
PW≤10μs
10μs
100μs
1ms
10ms
100ms
DC operation
IDC(*1)=8.5A
IDpack(*2)=6.9A
Operation in this area is limited by RDS(on).
Tc=25°C
Single pulse
*1. Shows chip capability
*2. SANYO's ideal heat dissipation condition
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT12402


PD – Ta
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT12337


PD – Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
IT12382


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

Note on usage : Since the 2SK4099LS is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

This catalog provides information as of June, 2007. Specifications and information herein are subject to change without notice.