Ordering number : ENN7910

SANYO Semiconductors
DATA SHEET

N-Channel Silicon MOSFET

2SK3101LS — General-Purpose Switching Device Applications

Features

- Low ON-resistance.
- Low Qg.
- Ultrahigh-Speed Switching Applications.
- Avalanche resistance guarantee.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		400	V
Gate-to-Source Voltage	V_{GSS}		±30	V
Drain Current (DC)	I_D		11	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	44	A
Allowable Power Dissipation	P_D		2.0	W
		Tc=25°C	40	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Enargy (Single Pulse) *1	E_{AS}		69.1	mJ
Avalanche Current *2	I_{AV}		11	A

*1 V_{DD}=50V, L=1mH, I_{AV}=11A

*2 L≤1mH, single pulse

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	400			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=320V, 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	3.0		4.0	V
Forward Transfer Admittance	|yfs|	V_{DS}=10V, I_D=8A	4.0	8.0		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)	I_D=8A, V_{GS}=15V		0.32	0.4	Ω

Marking : K3101

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SANYO Electric Co.,Ltd. Semiconductor Company
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

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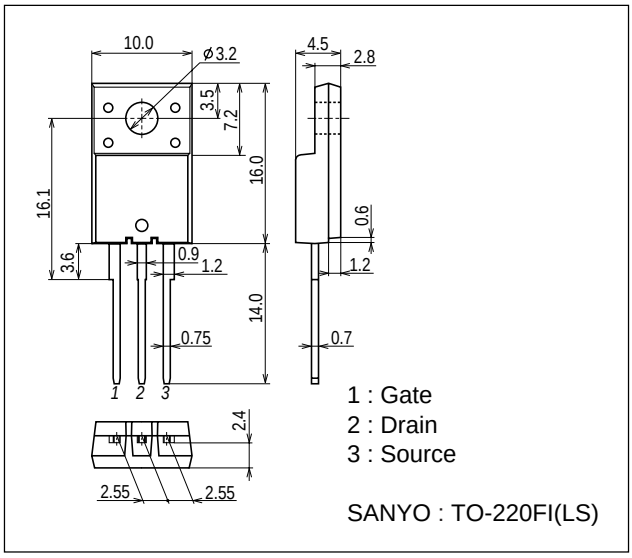
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		1850		pF
Output Capacitance	Coss	V_{DS}=20V, f=1MHz		480		pF
Reverse Transfer Capacitance	Crss	V_{DS}=20V, f=1MHz		240		pF
Turn-ON Delay Time	t_{d}(on)	See specified Test Circuit.		19		ns
Rise Time	t_{r}	See specified Test Circuit.		35		ns
Turn-OFF Delay Time	t_{d}(off)	See specified Test Circuit.		140		ns
Fall Time	t_{f}	See specified Test Circuit.		41		ns
Total Gate Charge	Qg	V_{DS}=200V, V_{GS}=10V, I_{D}=11A		58		nC
Diode Forward Voltage	V_{SD}	I_{S}=11A, V_{GS}=0		0.9	1.2	V

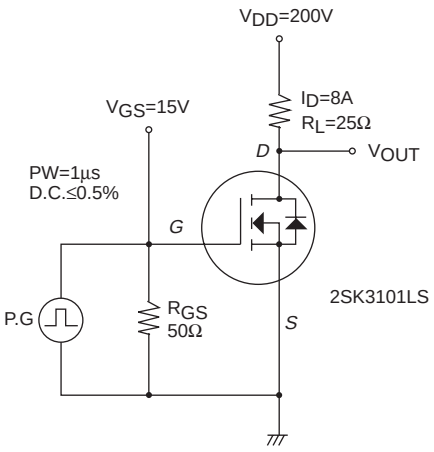
Package Dimensions

unit : mm

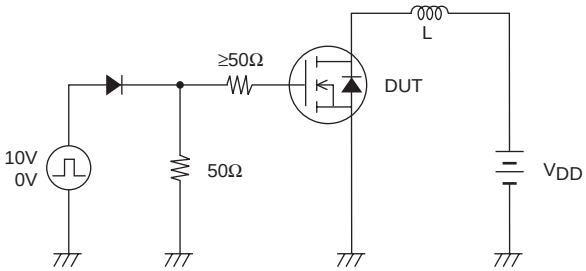
2078C

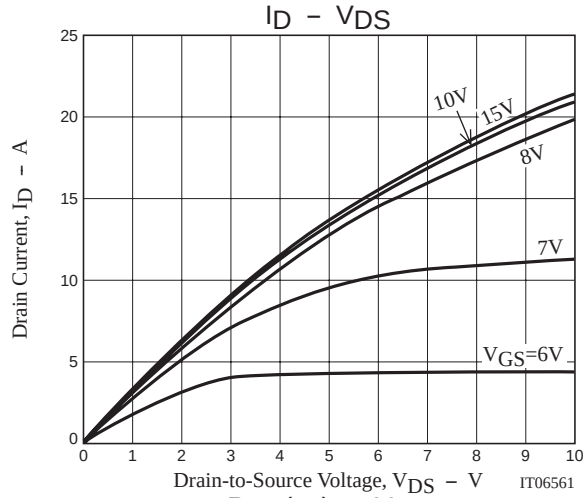


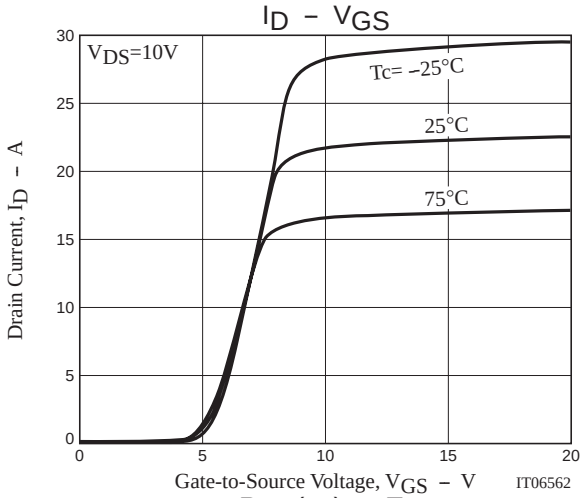
Switching Time Test Circuit

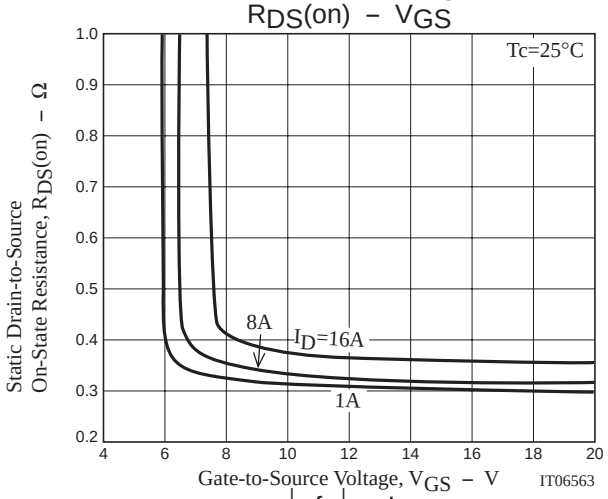


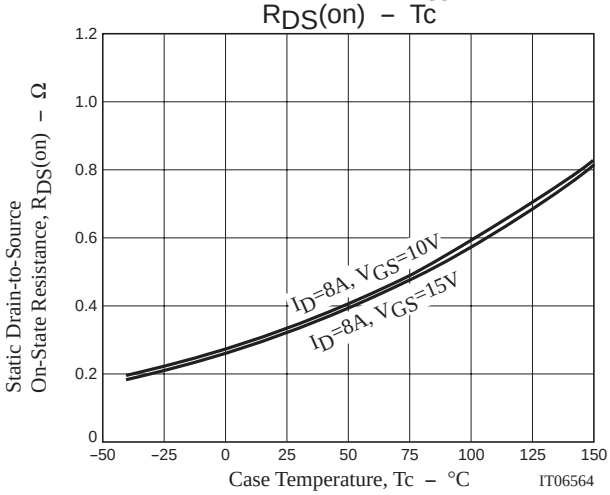
Unclamped Inductive Test Circuit

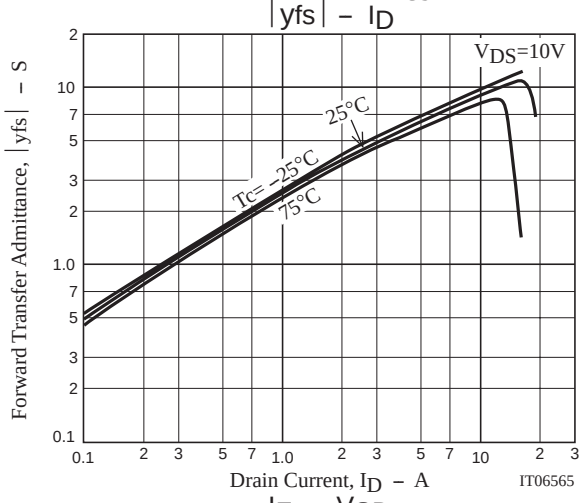


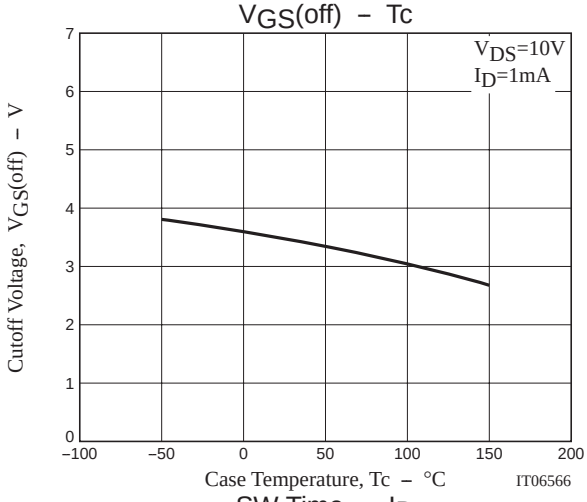

ID – VDS
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
10V
15V
8V
7V
VGS=6V
IT06561

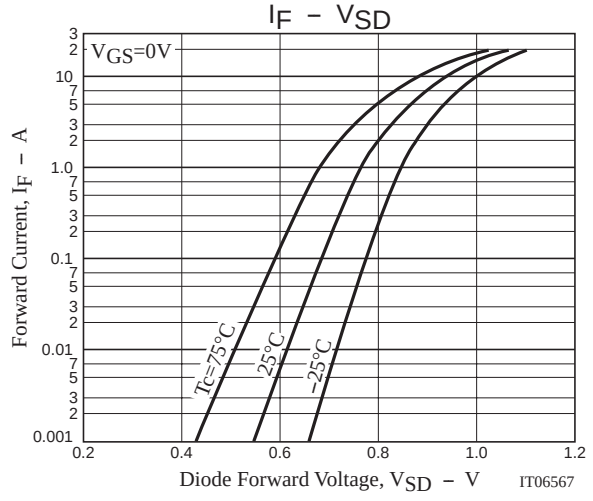

ID – VGS
VDS=10V
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
Tc= –25°C
25°C
75°C
IT06562

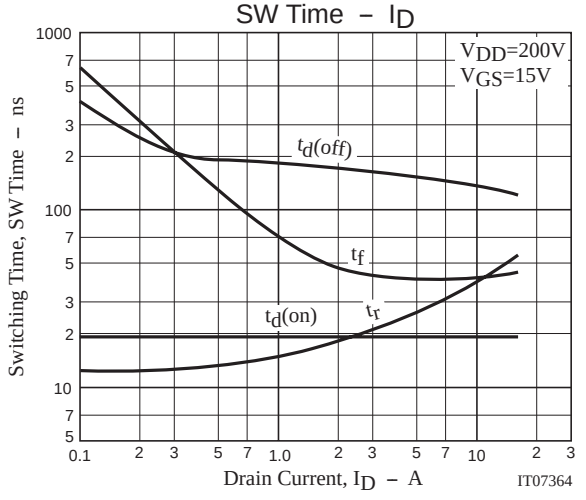

RDS(on) – VGS
Tc=25°C
Static Drain-to-Source
On-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V
8A
ID=16A
1A
IT06563

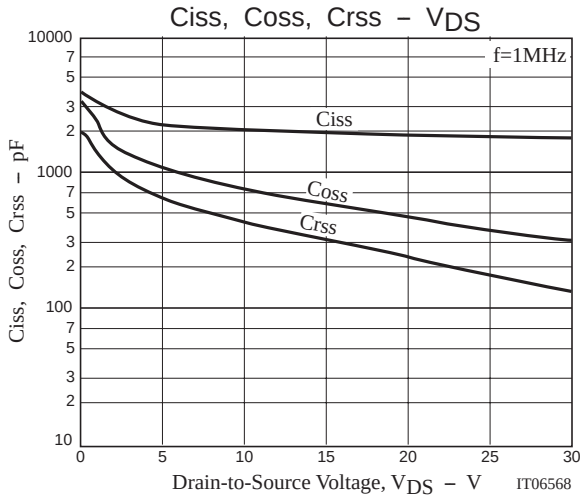

RDS(on) – Tc
Static Drain-to-Source
On-State Resistance, RDS(on) – Ω
Case Temperature, Tc – °C
ID=8A, VGS=10V
ID=8A, VGS=15V
IT06564

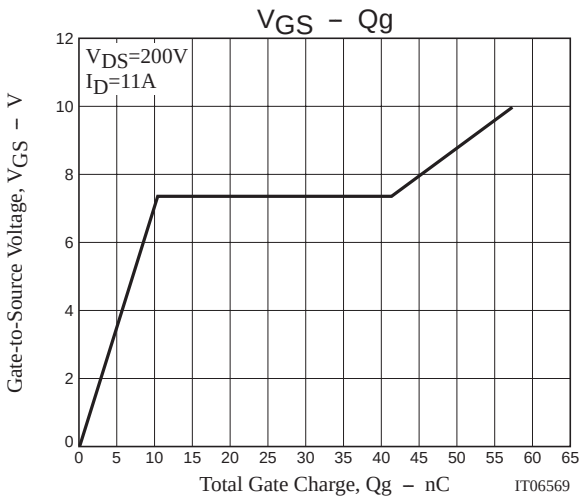

|yfs| – ID
VDS=10V
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
25°C
Tc= –25°C
75°C
IT06565

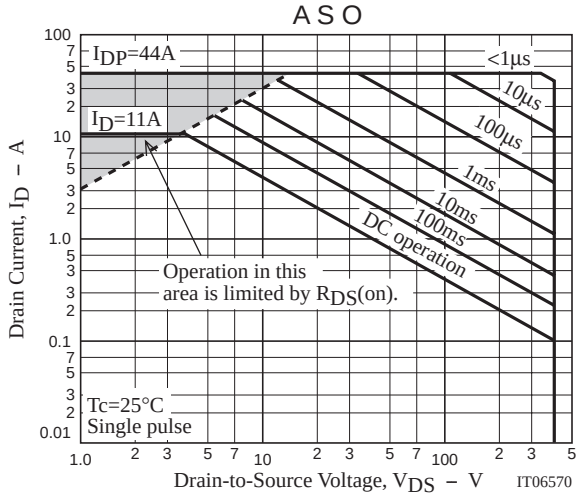

VGS(off) – Tc
VDS=10V
ID=1mA
Cutoff Voltage, VGS(off) – V
Case Temperature, Tc – °C
IT06566

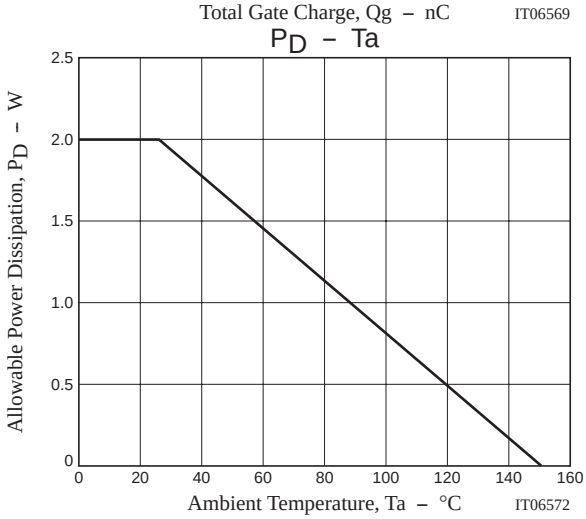

IF – VSD
VGS=0V
Forward Current, IF – A
Diode Forward Voltage, VSD – V
Tc=75°C
25°C
–25°C
IT06567

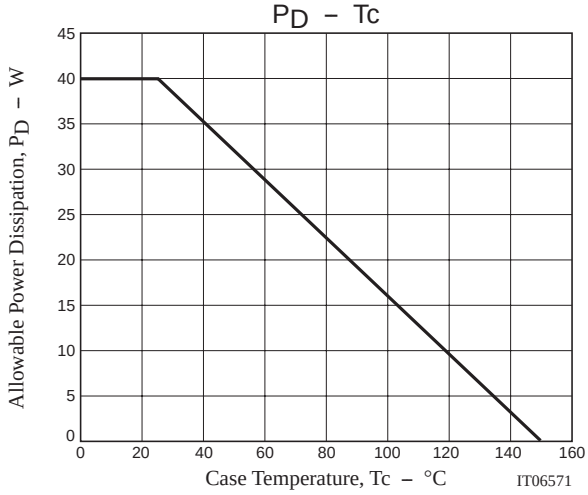

SW Time – ID
VDD=200V
VGS=15V
Switching Time, SW Time – ns
Drain Current, ID – A
td(off)
tf
tr
td(on)
IT07364


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT06568


VGS – Qg
VDS=200V
ID=11A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT06569


A S O
IDP=44A
ID=11A
<1μs
10μs
100μs
1ms
10ms
100ms
DC operation
Operation in this
area is limited by RDS(on).
Tc=25°C
Single pulse
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT06570


PD – Ta
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT06572


PD – Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
IT06571

Note on usage : Be careful in handling the 2SK3101LS because it has no protection diode between gate and source.