Ordering number : ENA0555D

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

N-Channel Silicon MOSFET

2SK4087LS — General-Purpose Switching Device Applications

Features

- ON-resistance $R_{DS}(on)$=0.47Ω (typ.)
- Input capacitance Ciss=1200pF (typ.)
- 10V drive

Specifications

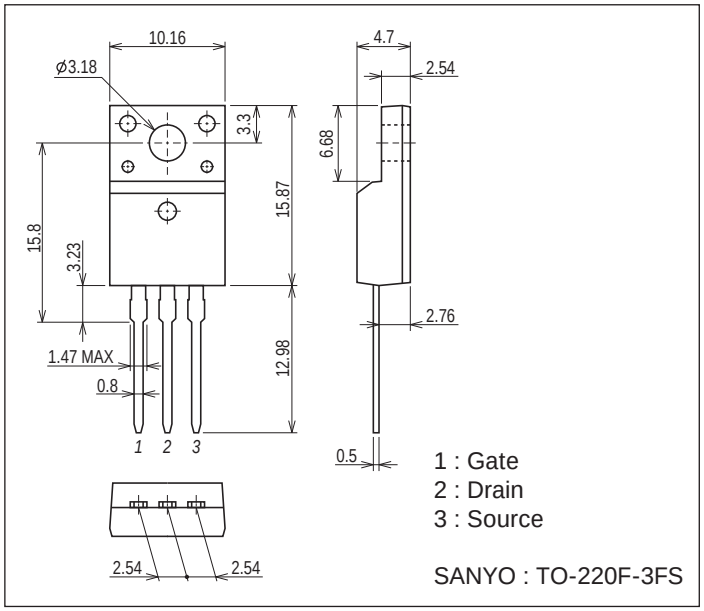
Absolute Maximum Ratings at Ta=25°C

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 Tch=150°C	14	A
	I_{Dpack} *2	Tc=25°C (SANYO's ideal heat dissipation condition)*3	9.2	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	52	A
Allowable Power Dissipation	P_D		2.0	W
		Tc=25°C (SANYO's ideal heat dissipation condition)*3	40	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *4	E_{AS}		106	mJ
Avalanche Current *5	I_{AV}		14	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}=50V, L=1mH, I_{AV}=14A (Fig.1)
*5 L≤1mH, Single pulse

Package Dimensions

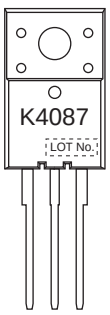
unit : mm (typ)
7528-001



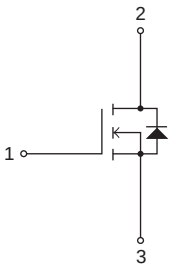
Product & Package Information

- Package : TO-220F-3FS
- JEITA, JEDEC : SC-67
- Minimum Packing Quantity : 50 pcs./magazine

Marking



Electrical Connection



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=7A	4	8		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)	I_D=7A, V_{GS}=10V		0.47	0.61	Ω
Input Capacitance	Ciss	V_{DS}=30V, f=1MHz		1200		pF
Output Capacitance	Coss			220		pF
Reverse Transfer Capacitance	Crss			50		pF
Turn-ON Delay Time	t_d(on)	See Fig.2		27		ns
Rise Time	t_r			72		ns
Turn-OFF Delay Time	t_d(off)			144		ns
Fall Time	t_f			48		ns
Total Gate Charge	Qg	V_{DS}=200V, V_{GS}=10V, I_D=14A		46		nC
Gate-to-Source Charge	Qgs			8.6		nC
Gate-to-Drain “Miller” Charge	Qgd			26.4		nC
Diode Forward Voltage	V_{SD}	I_S=14A, V_{GS}=0V		0.95	1.3	V

Fig.1 Avalanche Resistance Test Circuit

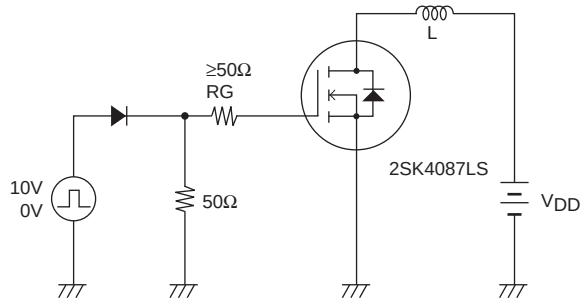
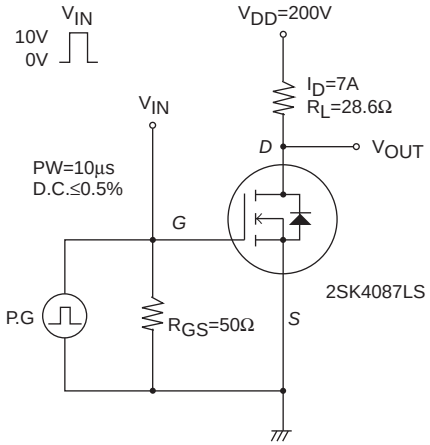
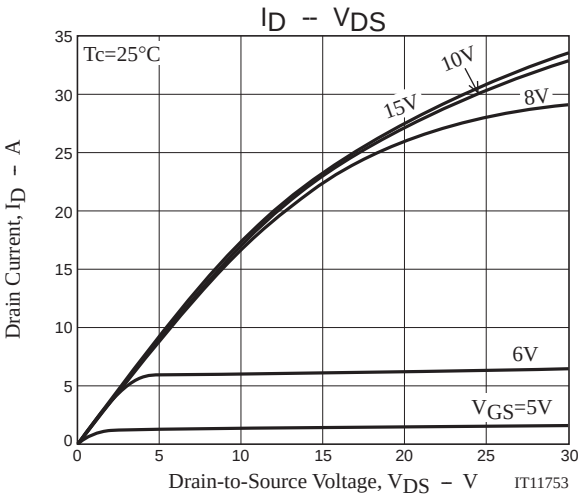
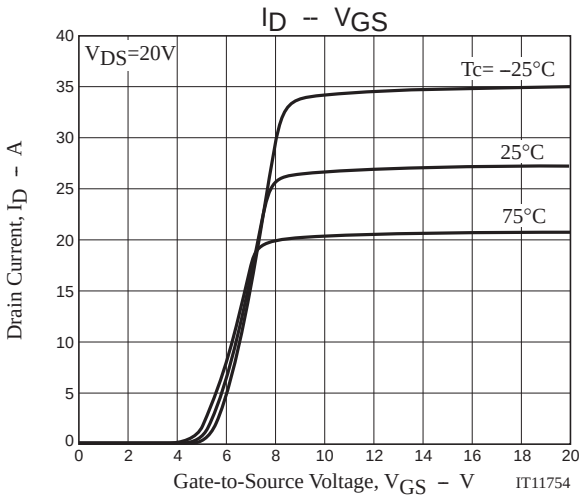
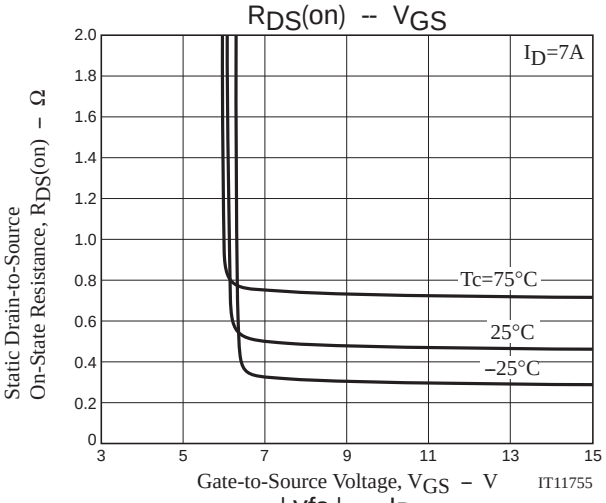


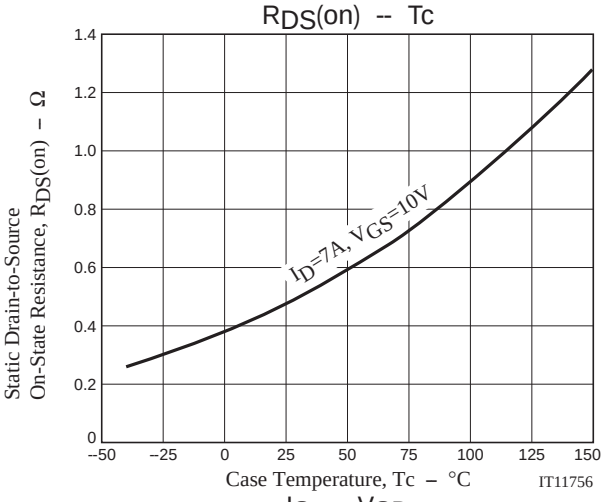
Fig.2 Switching Time Test Circuit

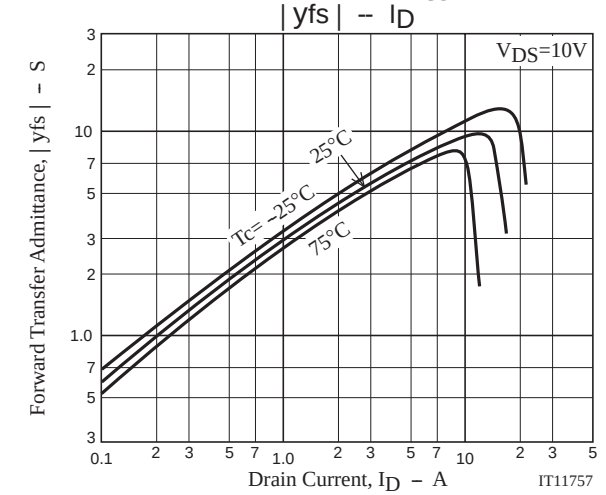


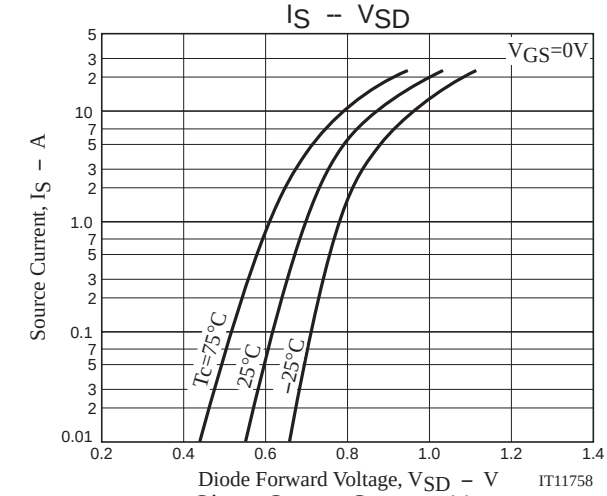


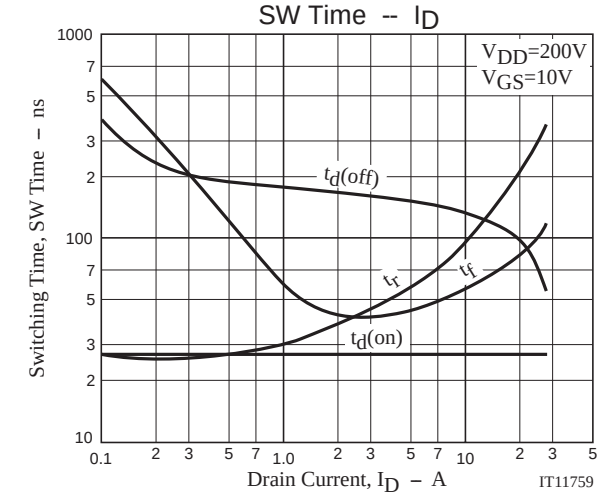


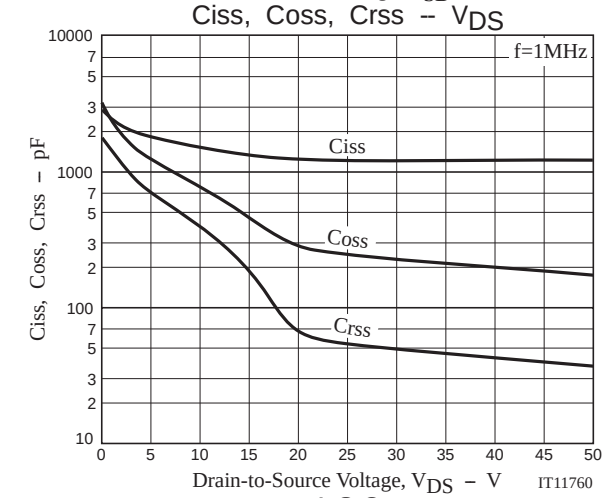

RDS(on) -- VGS
ID=7A
Tc=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V
IT11755

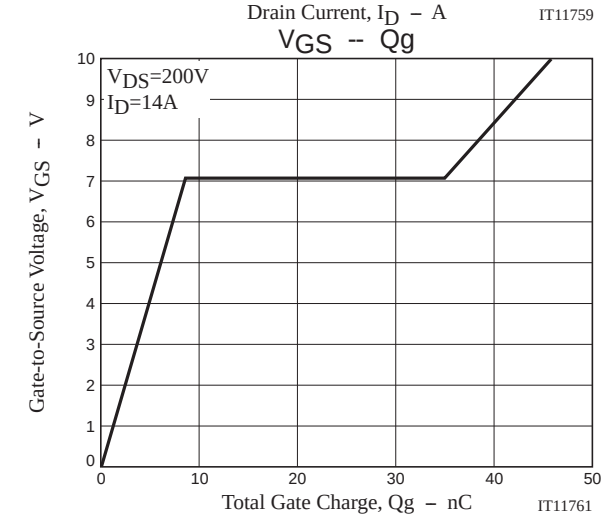

RDS(on) -- Tc
ID=7A, VGS=10V
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Case Temperature, Tc – °C
IT11756

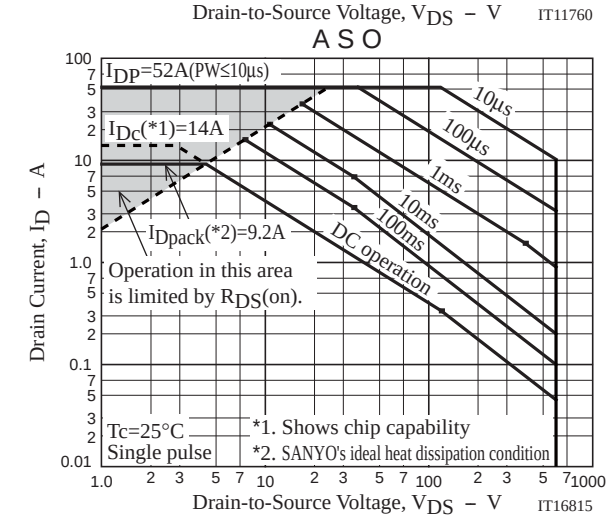

| yfs | -- ID
VDS=10V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT11757

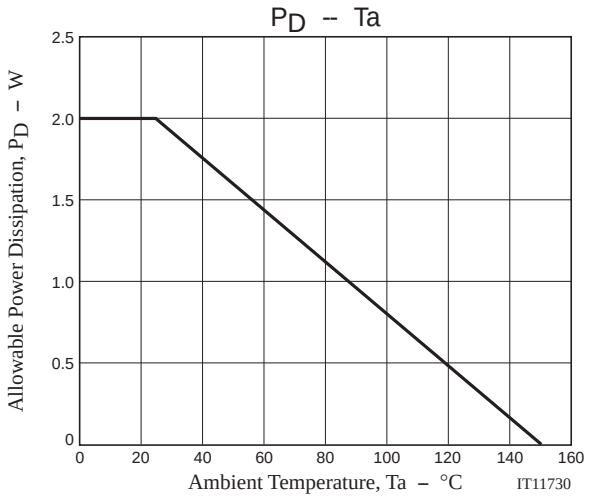

IS -- VSD
VGS=0V
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT11758

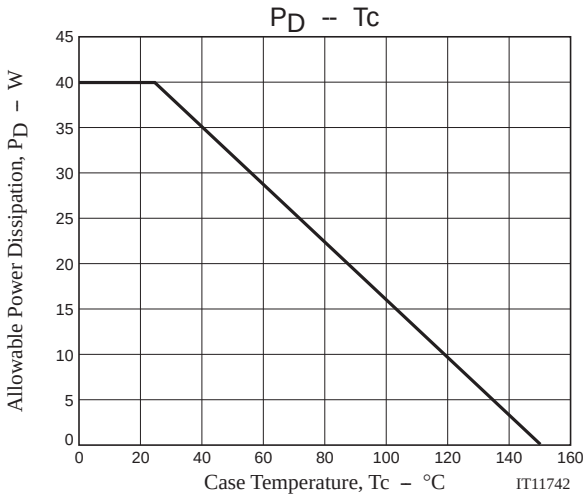

SW Time -- ID
VDD=200V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT11759

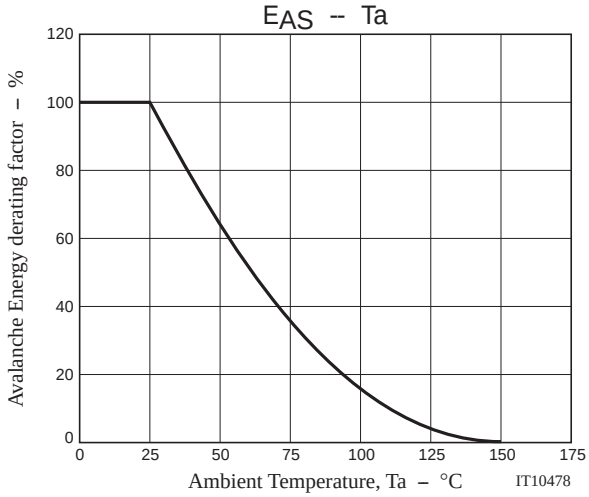

Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT11760


VGS -- Qg
VDS=200V
ID=14A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT11761


A S O
IDP=52A(PW≤10μs)
IDC(*1)=14A
IDpack(*2)=9.2A
10μs
100μs
1ms
10ms
100ms
DC operation
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
IT16815


PD -- Ta
Allowable Power Dissipation, PD – W
2.5
2.0
1.5
1.0
0.5
0
0 20 40 60 80 100 120 140 160
Ambient Temperature, Ta – °C
IT11730


PD -- Tc
Allowable Power Dissipation, PD – W
45
40
35
30
25
20
15
10
5
0
0 20 40 60 80 100 120 140 160
Case Temperature, Tc – °C
IT11742


EAS -- Ta
Avalanche Energy derating factor – %
120
100
80
60
40
20
0
0 25 50 75 100 125 150 175
Ambient Temperature, Ta – °C
IT10478

Note on usage : Since the 2SK4087LS is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

This catalog provides information as of April, 2012. Specifications and information herein are subject to change without notice.