Ordering number : EN8649

SANYO Semiconductors
DATA SHEET

P-Channel Silicon MOSFET

3LP03SS — General-Purpose Switching Device Applications

Features

- Low ON-resistance.
- High-speed switching.
- 2.5V drive.
- High resistance to damage from ESD (TYP 300V)
  [with a protection diode connected between the gate and source].

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		–30	V
Gate-to-Source Voltage (*1)	V_{GSS}		–10	V
Drain Current (DC)	I_D		–0.25	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	–1	A
Allowable Power Dissipation	P_D		0.15	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		–55 to +150	°C

(*1) : Note, when designing a circuit using this product, that it has a gate (oxide film) protection diode connected only between its gate and source.

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}=0V	–30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=–30V, V_{GS}=0V			–1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=–8V, V_{DS}=0V			–1	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=–10V, I_D=–100μA	–0.4		–1.4	V
Forward Transfer Admittance	$\|yfs\|$	V_{DS}=–10V, I_D=–120mA	0.24	0.4		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=–120mA, V_{GS}=–4V		1.5	1.9	Ω
	R_{DS}(on)2	I_D=–60mA, V_{GS}=–2.5V		2.0	2.8	Ω
	R_{DS}(on)3	I_D=–10mA, V_{GS}=–1.5V		4.0	8.0	Ω
Input Capacitance	Ciss	V_{DS}=–10V, f=1MHz		40		pF
Output Capacitance	Coss	V_{DS}=–10V, f=1MHz		8		pF
Reverse Transfer Capacitance	Crss	V_{DS}=–10V, f=1MHz		4.5		pF

Marking : XG

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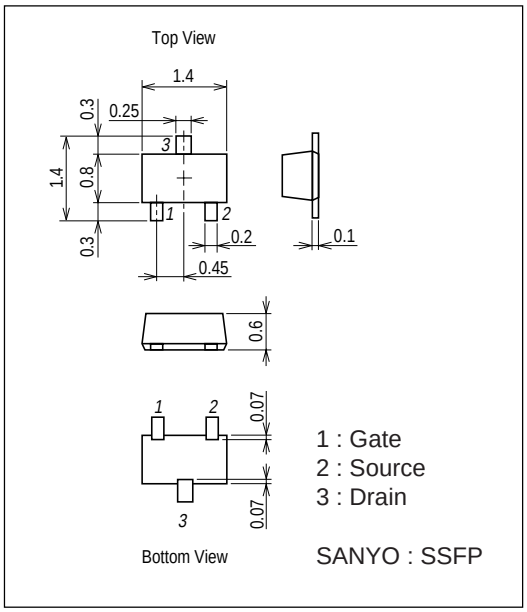
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		9.5		ns
Rise Time	t_r	See specified Test Circuit.		5		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		15		ns
Fall Time	t_f	See specified Test Circuit.		13		ns
Total Gate Charge	Qg	V_{DS}=–10V, V_{GS}=–4V, I_D=–250mA		0.8		nC
Gate-to-Source Charge	Qgs	V_{DS}=–10V, V_{GS}=–4V, I_D=–250mA		0.3		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=–10V, V_{GS}=–4V, I_D=–250mA		0.2		nC
Diode Forward Voltage	V_{SD}	I_S=–250mA, V_{GS}=0V		–0.9	–1.2	V

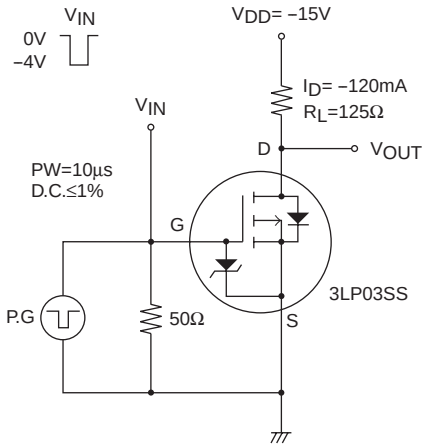
Package Dimensions

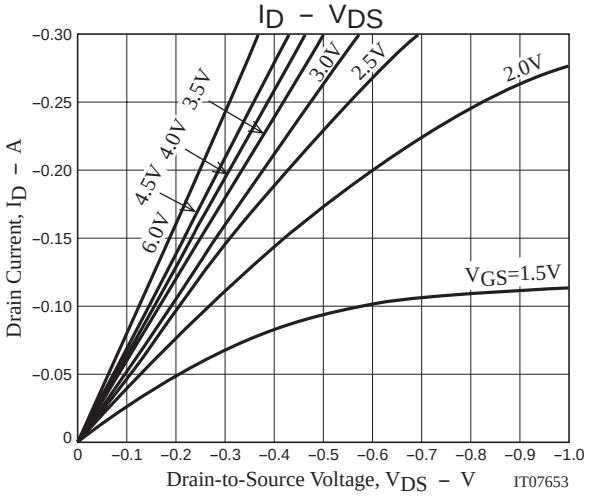
unit : mm

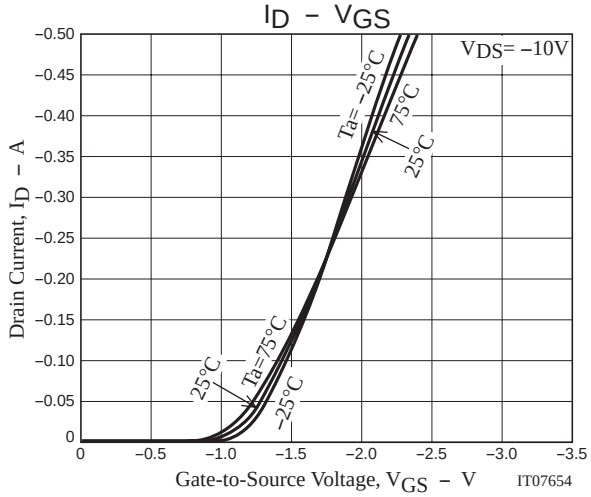
7029-003

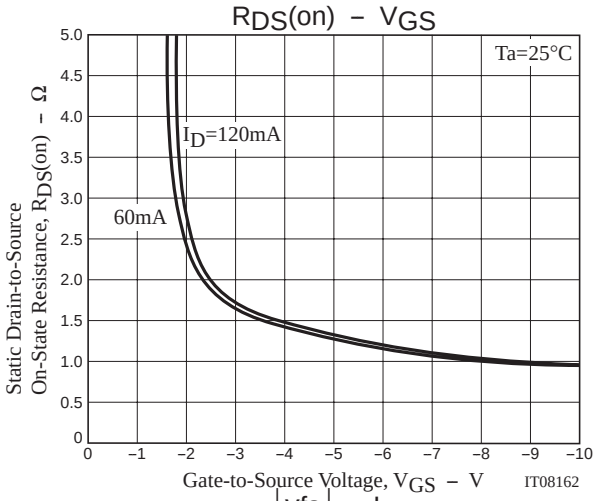


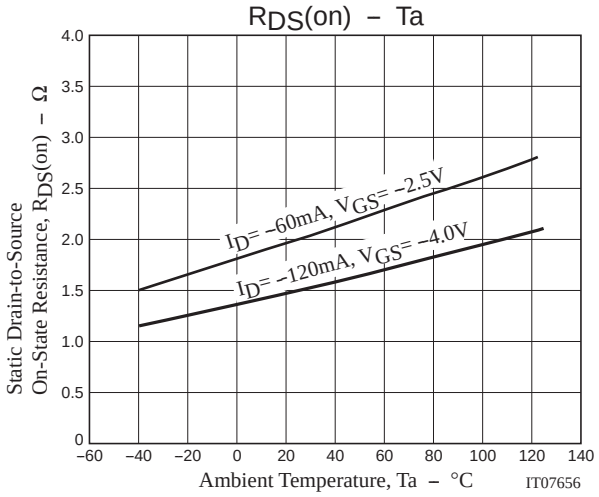
Switching Time Test Circuit

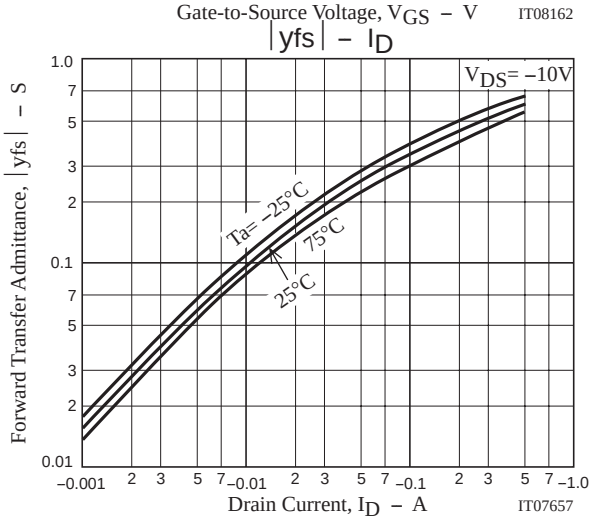


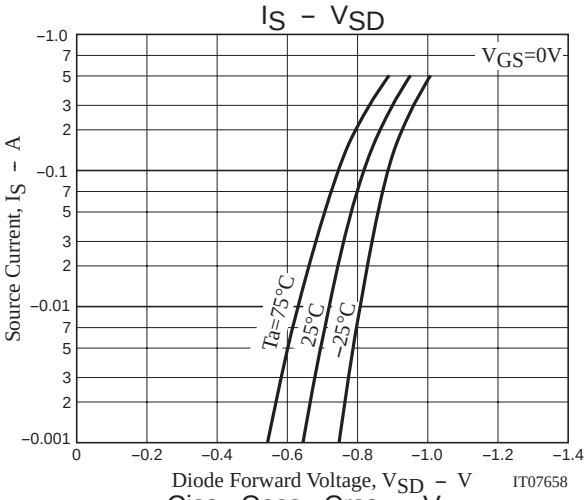


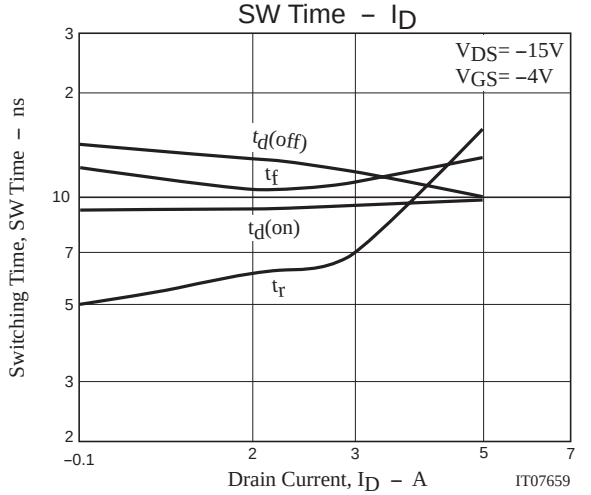


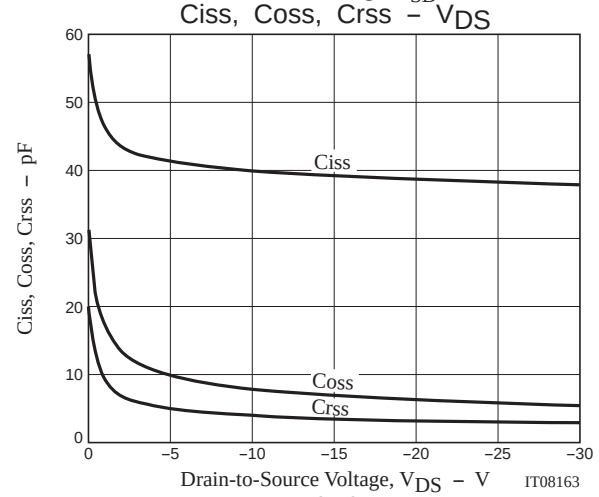

RDS(on) – VGS
Ta=25°C
ID=120mA
60mA
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V
IT08162

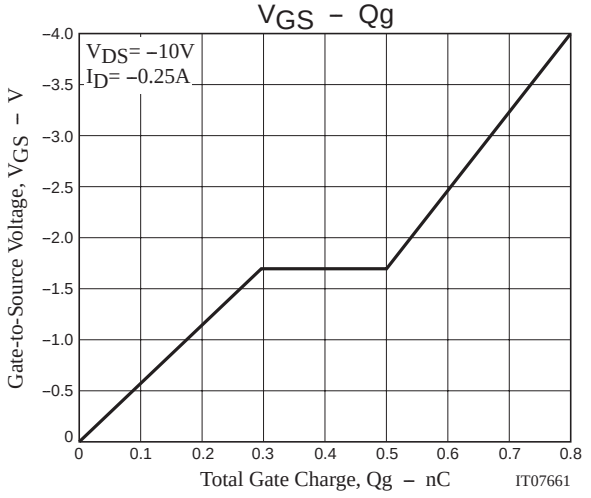

RDS(on) – Ta
ID= –60mA, VGS= –2.5V
ID= –120mA, VGS= –4.0V
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Ambient Temperature, Ta – °C
IT07656

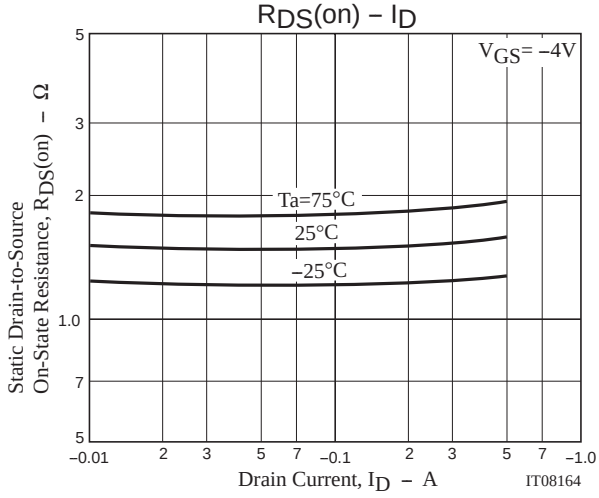

|yfs| – ID
VDS= –10V
Ta= –25°C
75°C
25°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT07657

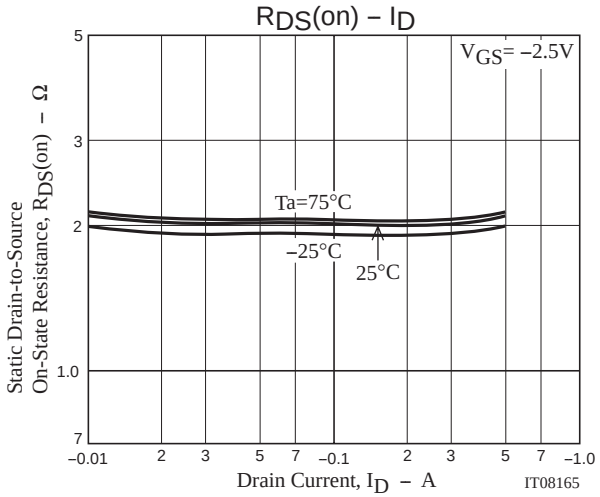

IS – VSD
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT07658

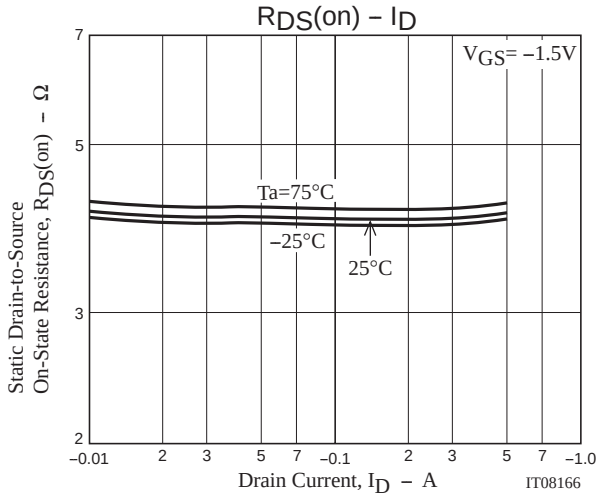

SW Time – ID
VDS= –15V
VGS= –4V
td(off)
tf
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT07659

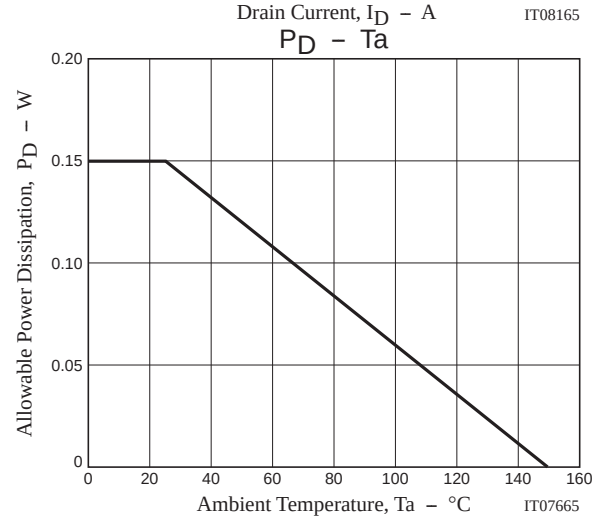

Ciss, Coss, Crss – VDS
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT08163


VGS – Qg
VDS= –10V
ID= –0.25A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT07661


RDS(on) – ID
VGS= –4V
Ta=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Drain Current, ID – A
IT08164







Note on usage : Since the 3LP03SS is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.