Ordering number : ENN6559

N-Channel Silicon MOSFET

5LN01SP

Ultrahigh-Speed Switching Applications

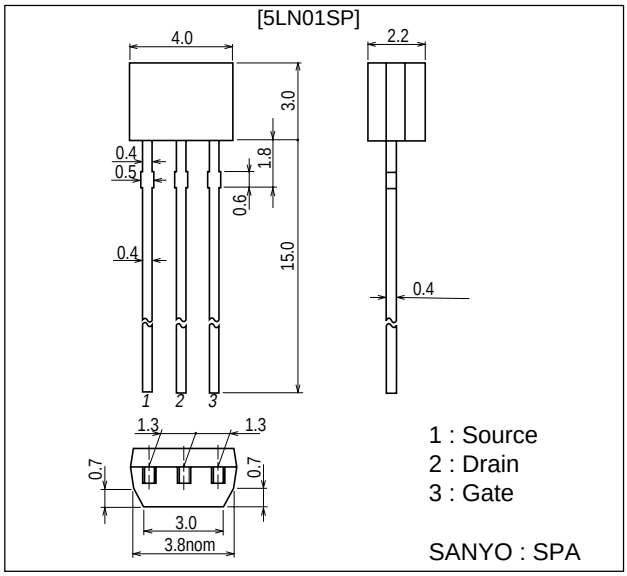
Features

- Low ON-resistance.
- Ultrahigh-speed switching.
- 2.5V drive.

Package Dimensions

unit : mm

2180



Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		50	V
Gate-to-Source Voltage	V_{GSS}		±10	V
Drain Current (DC)	I_D		0.1	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	0.4	A
Allowable Power Dissipation	P_D		0.25	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C

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	50			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=50V, V_{GS}=0			10	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0			±10	μA
Cutoff Voltage	$V_{GS(off)}$	V_{DS}=10V, I_D=100μA	0.4		1.3	V
Forward Transfer Admittance	$\|yfs\|$	V_{DS}=10V, I_D=50mA	0.13	0.18		S

Marking : YB

Continued on next page.

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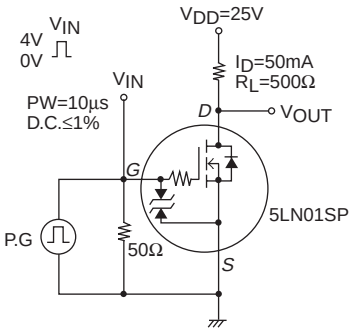
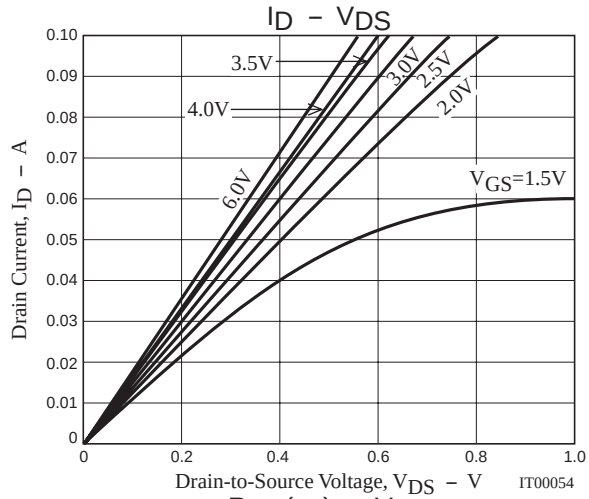
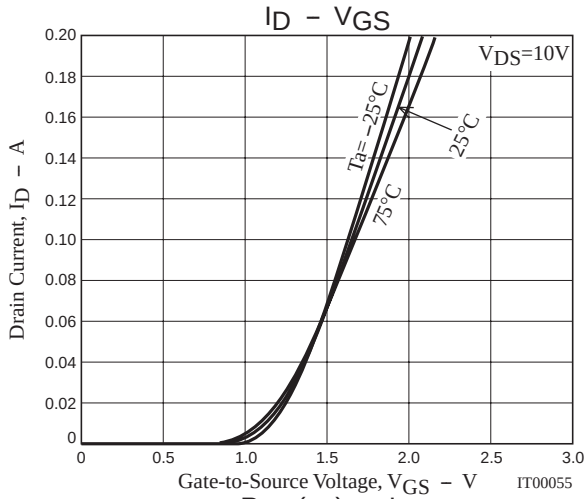
Continued from preceding page.

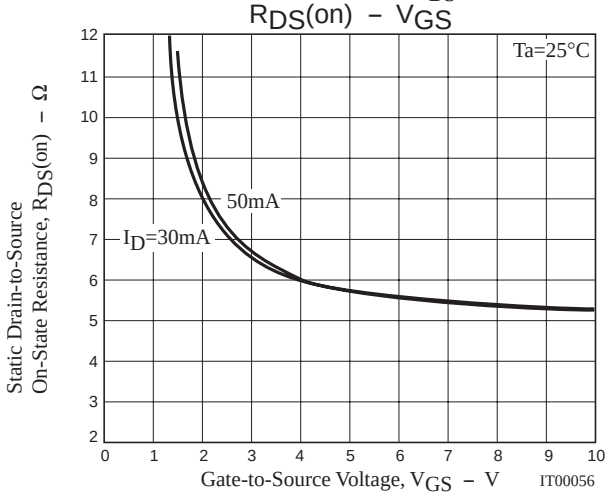
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Static Drain-to-Source On-State Resistance	$R_{DS}(on)1$	I_D=50mA, V_{GS}=4V		6	7.8	Ω
	$R_{DS}(on)2$	I_D=30mA, V_{GS}=2.5V		7.1	9.9	Ω
	$R_{DS}(on)3$	I_D=10mA, V_{GS}=1.5V		10	20	Ω
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		6.6		pF
Output Capacitance	Coss	V_{DS}=10V, f=1MHz		4.7		pF
Reverse Transfer Capacitance	Crss	V_{DS}=10V, f=1MHz		1.7		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit		18		ns
Rise Time	t_r	See specified Test Circuit		42		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit		190		ns
Fall Time	t_f	See specified Test Circuit		105		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=10V, I_D=100mA		1.57		nC
Gate-to-Source Charge	Qgs	V_{DS}=10V, V_{GS}=10V, I_D=100mA		0.20		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=10V, V_{GS}=10V, I_D=100mA		0.32		nC
Diode Forward Voltage	V_{SD}	I_S=100mA, V_{GS}=0		0.85	1.2	V

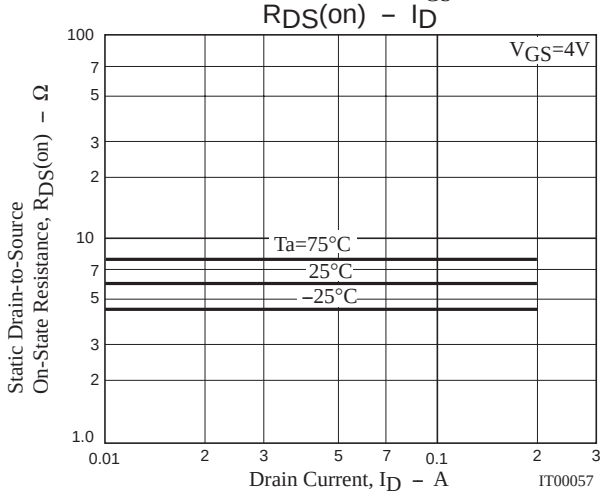
Switching Time Test Circuit

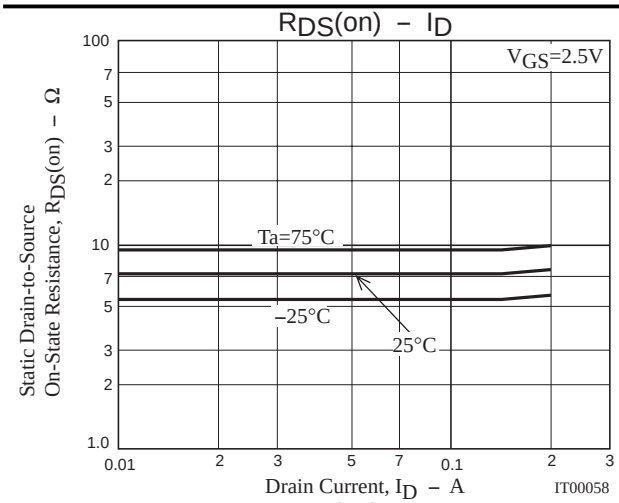


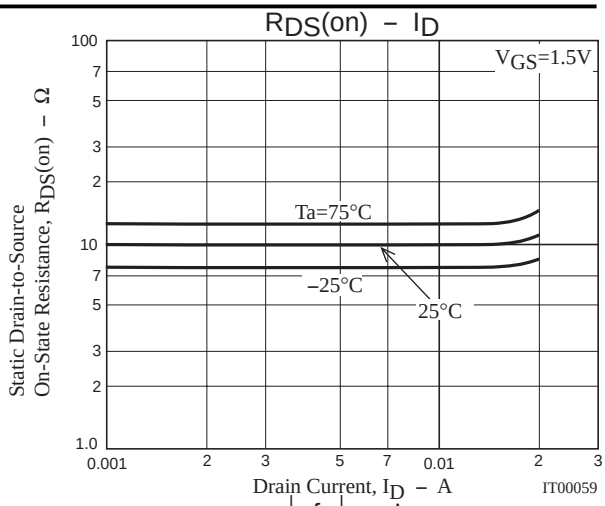


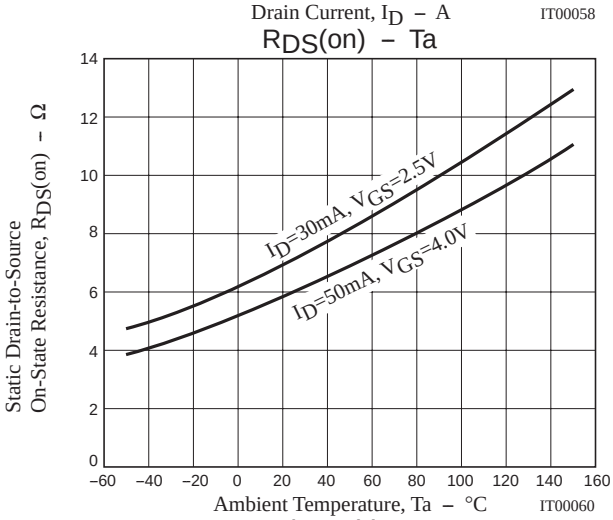


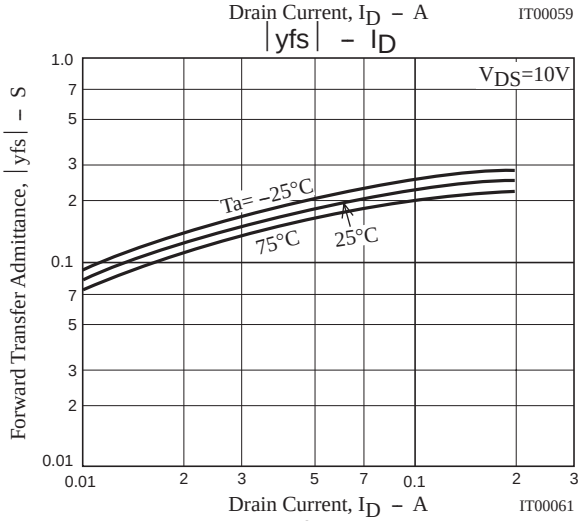


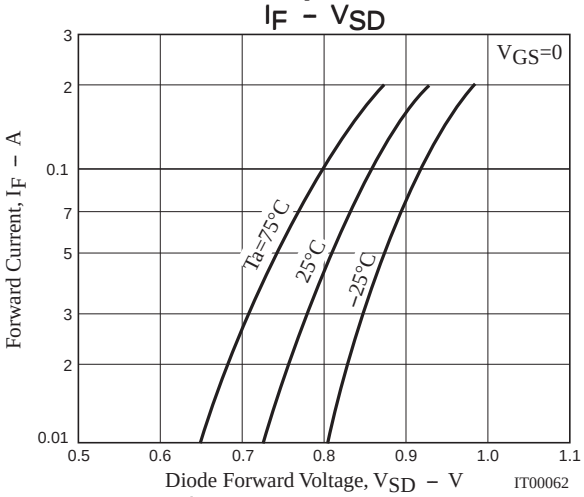


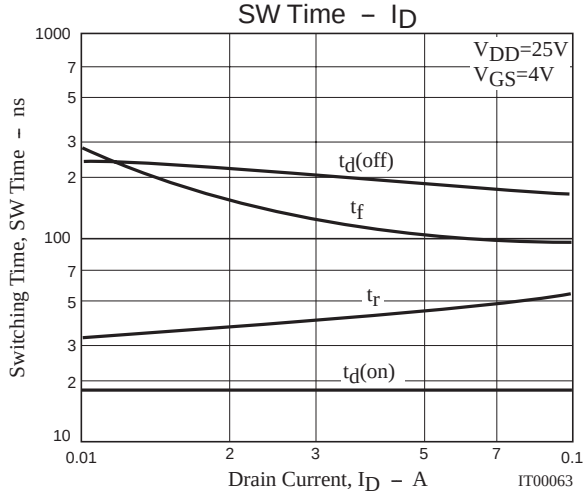

RDS(on) – ID
VGS=2.5V
Ta=75°C
–25°C
25°C
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Drain Current, ID – A
IT00058

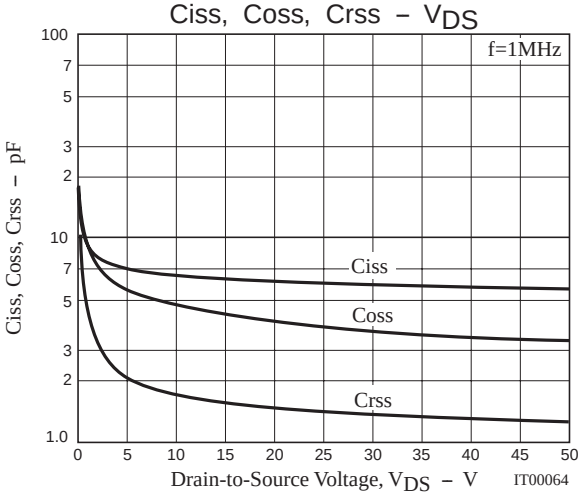

RDS(on) – ID
VGS=1.5V
Ta=75°C
–25°C
25°C
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Drain Current, ID – A
IT00059

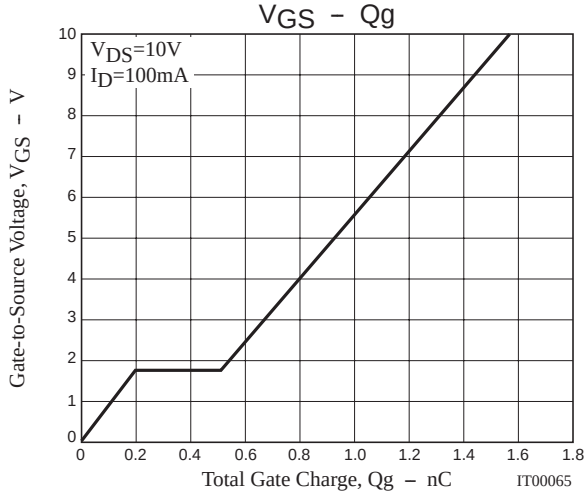

RDS(on) – Ta
ID=30mA, VGS=2.5V
ID=50mA, VGS=4.0V
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Ambient Temperature, Ta – °C
IT00060

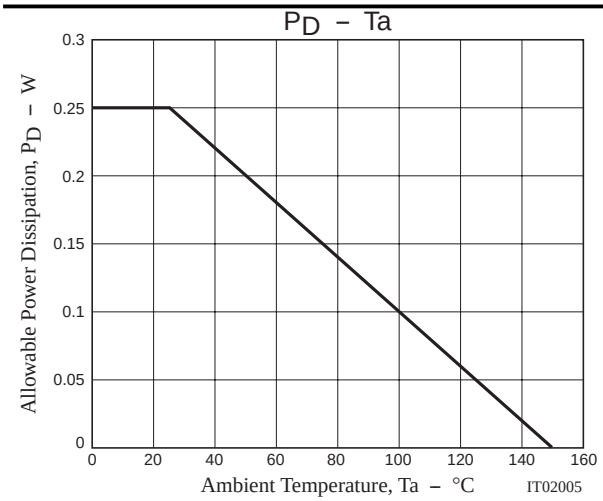

|yfs| – ID
VDS=10V
Ta= –25°C
75°C
25°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT00061


IF – VSD
VGS=0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT00062


SW Time – ID
VDD=25V
VGS=4V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT00063


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT00064


VGS – Qg
VDS=10V
ID=100mA
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT00065



Note on usage : Since the 5LN01SP is designed for high-speed switching applications, please avoid using this device in the vicinity of highly charged objects.