Ordering number:ENN6539

N-Channel Silicon MOSFET

5LN02SP

Ultrahigh-Speed Switching Applications

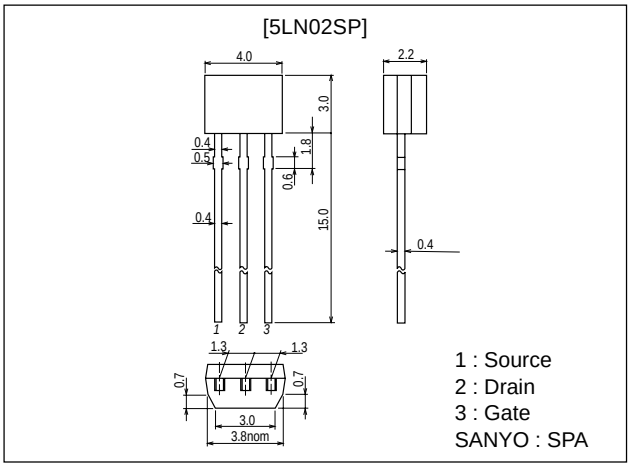
Features

- 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		0.2	A
Drain Current (pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	0.8	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=100mA	0.34	0.49		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=100mA, V_{GS}=4V		1.9	2.4	Ω
	R_{DS}(on)2	I_D=50mA, V_{GS}=2.5V		2.2	3	Ω
	R_{DS}(on)3	I_D=10mA, V_{GS}=1.5V		3.2	6.4	Ω

Marking : YE

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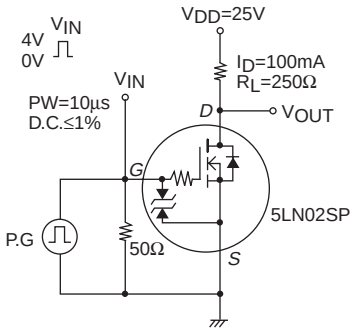
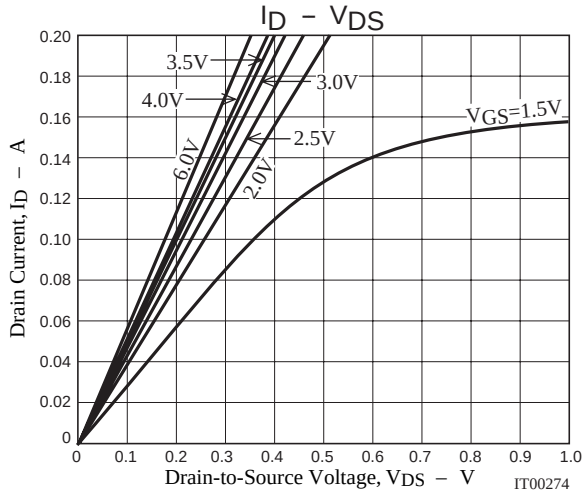
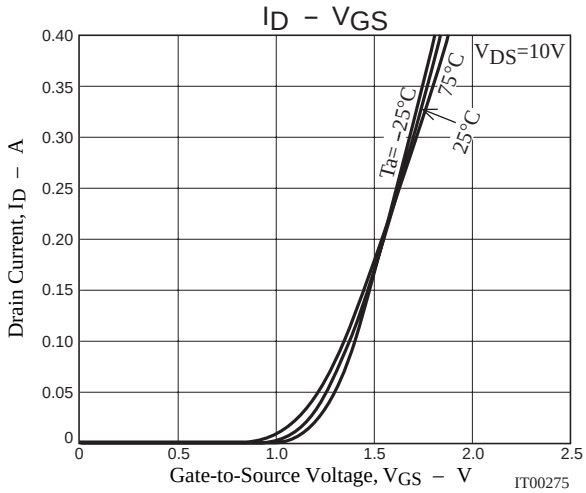
Continued from preceding page.

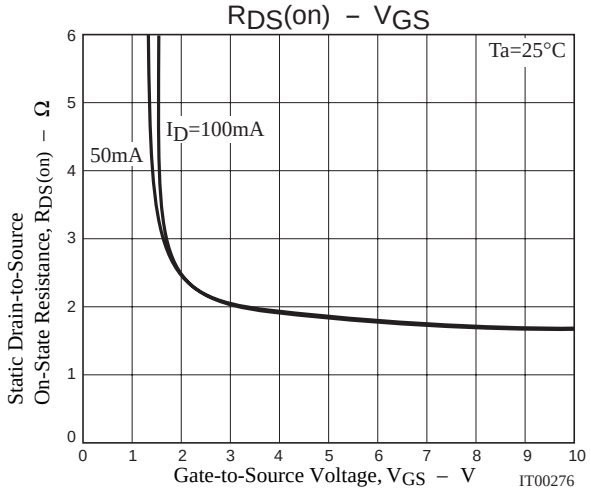
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		25		pF
Output Capacitance	Coss	V_{DS}=10V, f=1MHz		12		pF
Reverse Transfer Capacitance	Crss	V_{DS}=10V, f=1MHz		4.5		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit		25		ns
Rise Time	t_r	See specified Test Circuit		75		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit		350		ns
Fall Time	t_f	See specified Test Circuit		170		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=10V, I_D=200mA		2.18		nC
Gate-to-Source Charge	Qgs	V_{DS}=10V, V_{GS}=10V, I_D=200mA		0.28		nC
Gate-to-Drain "Miller" Charge	Qgd	V_{DS}=10V, V_{GS}=10V, I_D=200mA		0.45		nC
Diode Forward Voltage	V_{SD}	I_S=200mA, V_{GS}=0		0.83	1.2	V

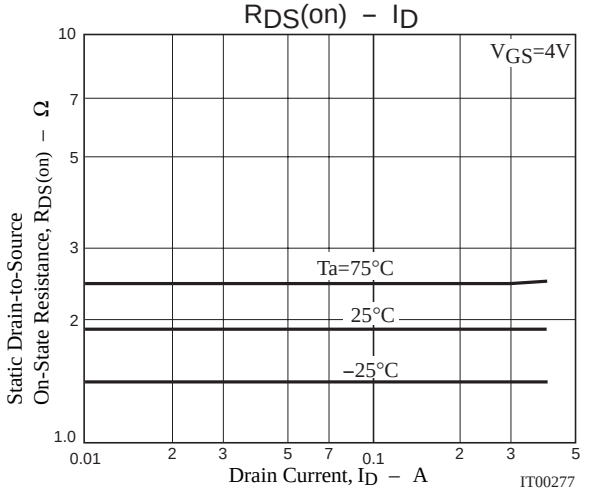
Switching Time Test Circuit

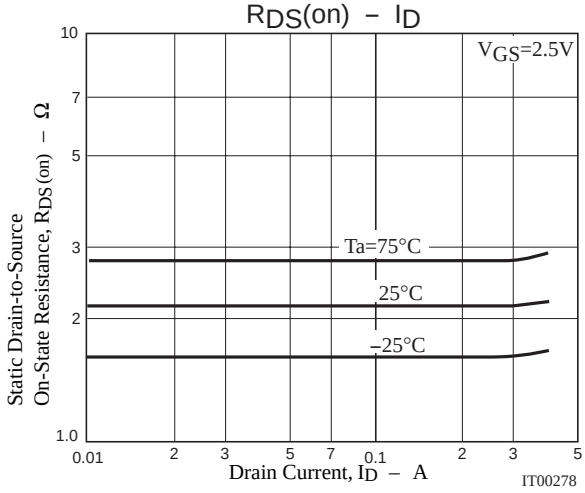


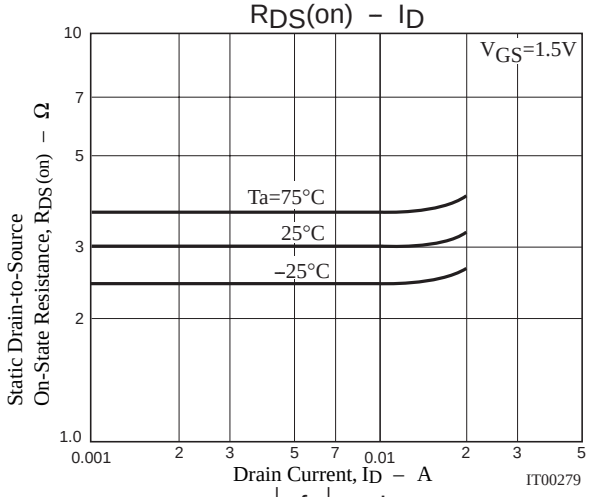


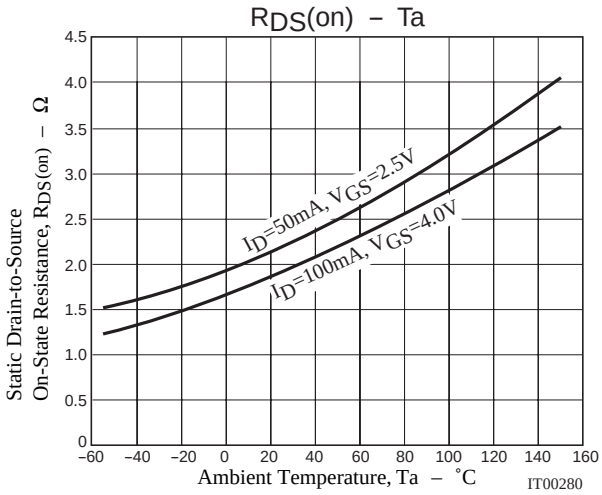


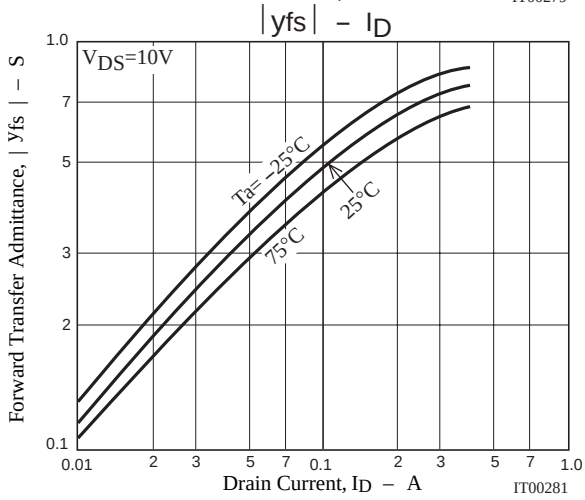


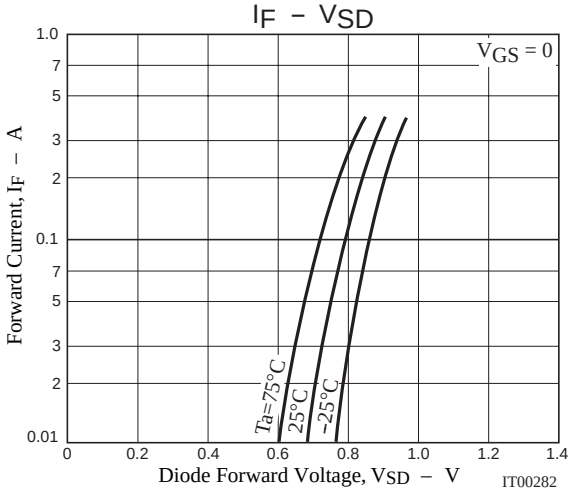


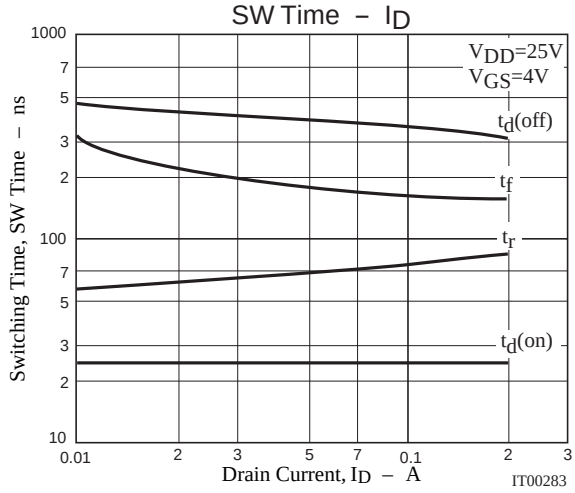

RDS(on) – ID
VGS=2.5V
Ta=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Drain Current, ID – A
IT00278

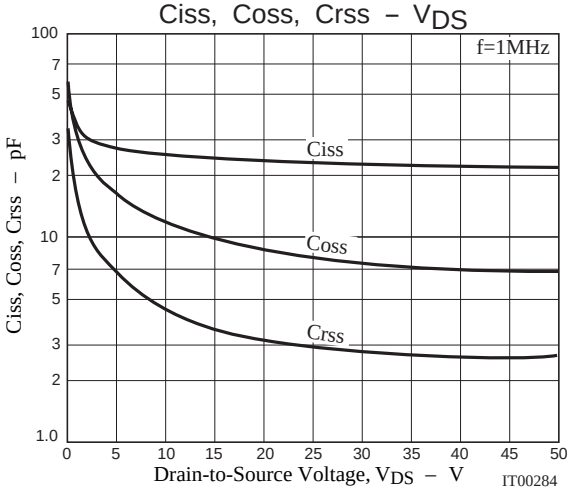

RDS(on) – ID
VGS=1.5V
Ta=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Drain Current, ID – A
IT00279

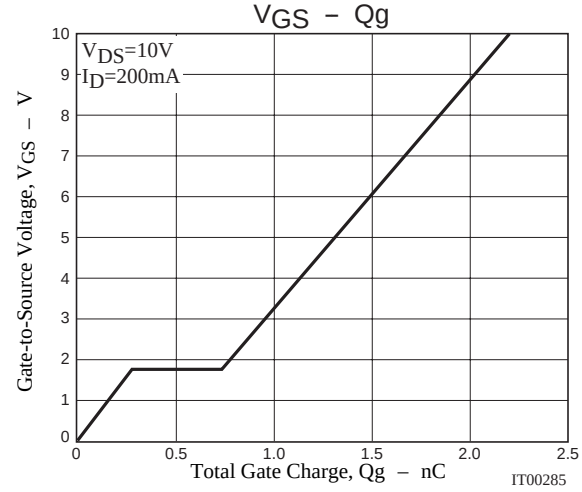

RDS(on) – Ta
ID=50mA, VGS=2.5V
ID=100mA, VGS=4.0V
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Ambient Temperature, Ta – °C
IT00280

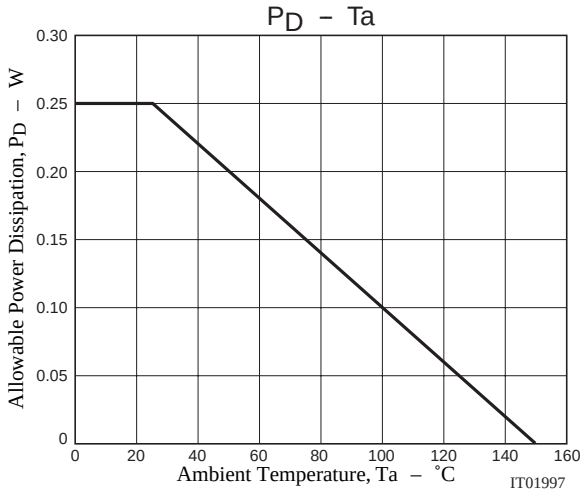

|yfs| – ID
VDS=10V
Ta= –25°C
25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT00281


IF – VSD
VGS = 0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT00282


SW Time – ID
VDD=25V
VGS=4V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT00283


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT00284


VGS – Qg
VDS=10V
ID=200mA
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT00285



Note on usage : Since the 5LN02SP is designed for high-speed switching applications, please avoid using this device in the vicinity of highly charged objects.