Ordering number : ENN6638

N-Channel Silicon MOSFET

5HN01N

Ultrahigh-Speed Switching Applications

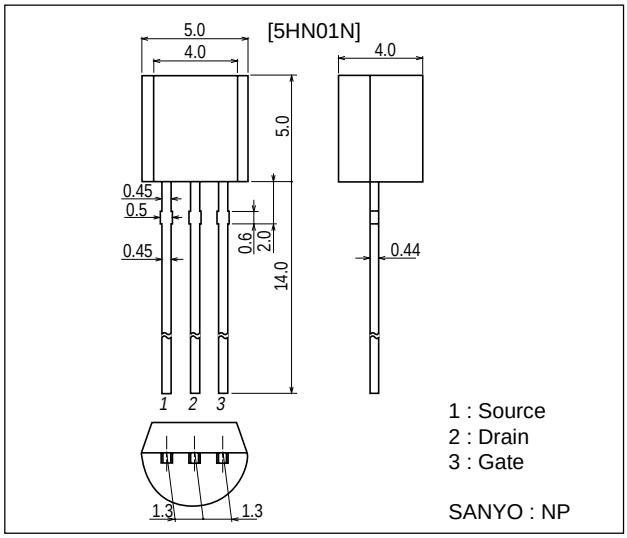
Features

- Low ON-resistance.
- Ultrahigh-speed switching.
- 4V drive.

Package Dimensions

unit : mm

2178



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}		±20	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		0.4	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-Sourse Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0			±10	μA
Cutoff Voltage	$V_{GS(off)}$	V_{DS}=10V, I_D=100μA	1		2.4	V

Continued on next page.

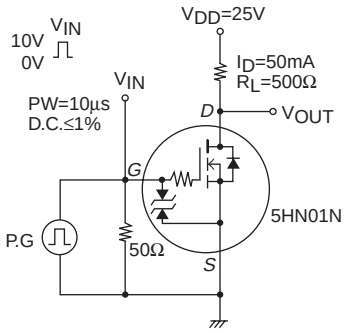
SANYO Electric Co.,Ltd. Semiconductor Company
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

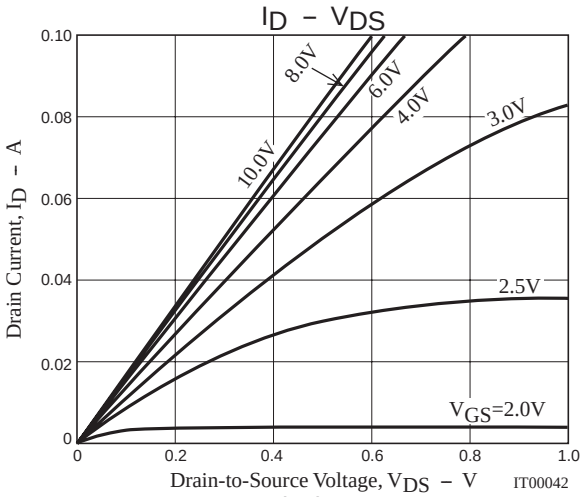
Continued from preceding page.

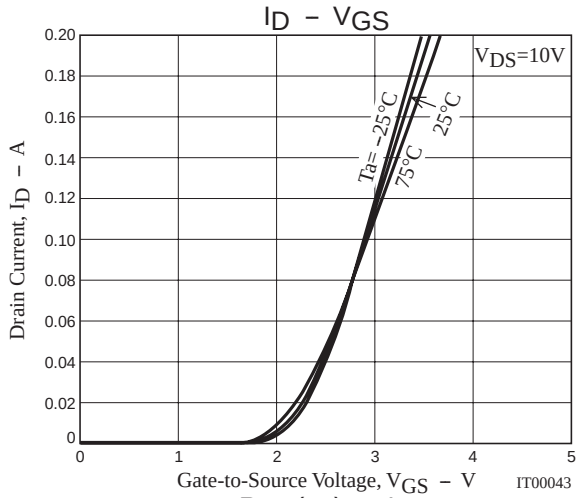
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Forward Transfer Admittance	|yfs|	V_{DS}=10V, I_D=50mA	85	120		mS
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=50mA, V_{GS}=10V		5.8	7.5	Ω
	R_{DS}(on)2	I_D=30mA, V_{GS}=4V		7.5	10.5	Ω
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		6.2		pF
Output Capacitance	Coss	V_{DS}=10V, f=1MHz		4.4		pF
Reverse Transfer Capacitance	Crss	V_{DS}=10V, f=1MHz		1.5		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit		10		ns
Rise Time	t_r	See specified Test Circuit		11		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit		105		ns
Fall Time	t_f	See specified Test Circuit		75		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=10V, I_D=100mA		1.40		nC
Gate Source Charge	Qgs	V_{DS}=10V, V_{GS}=10V, I_D=100mA		0.21		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=10V, V_{GS}=10V, I_D=100mA		0.34		nC
Diode Forward Voltage	V_{SD}	I_S=100mA, V_{GS}=0		0.85	1.2	V

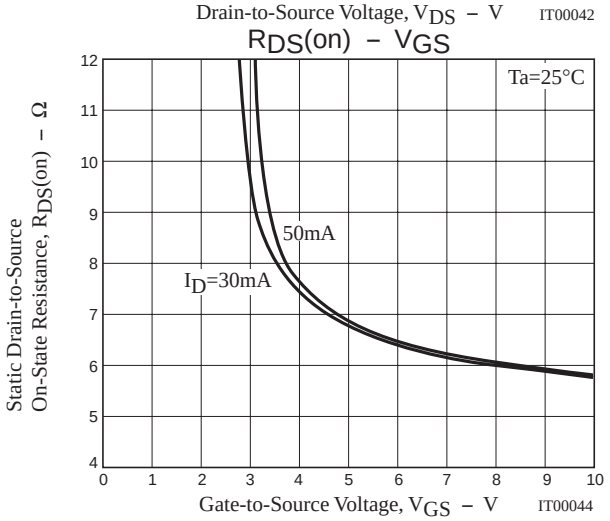
Marking : YC

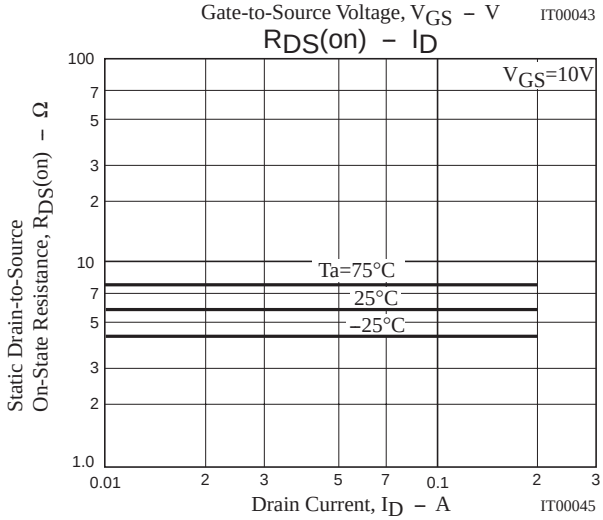
Switching Time Test Circuit

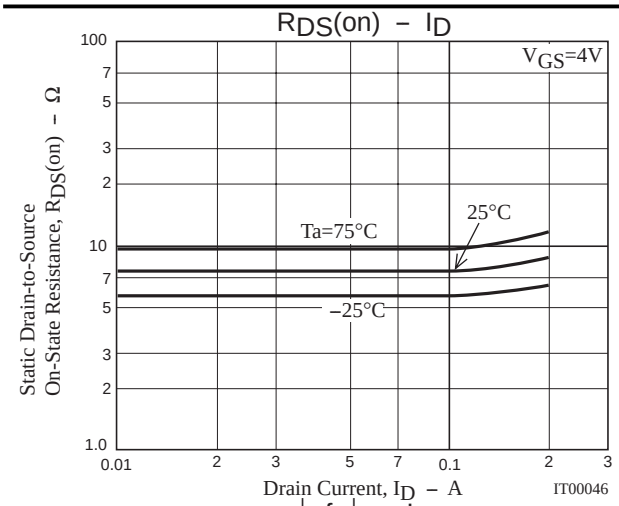


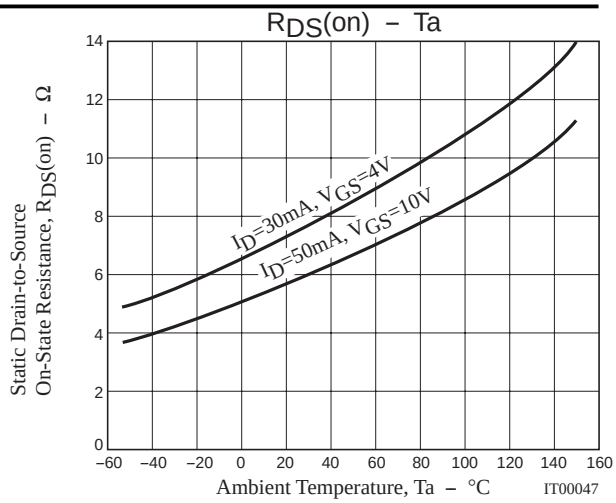


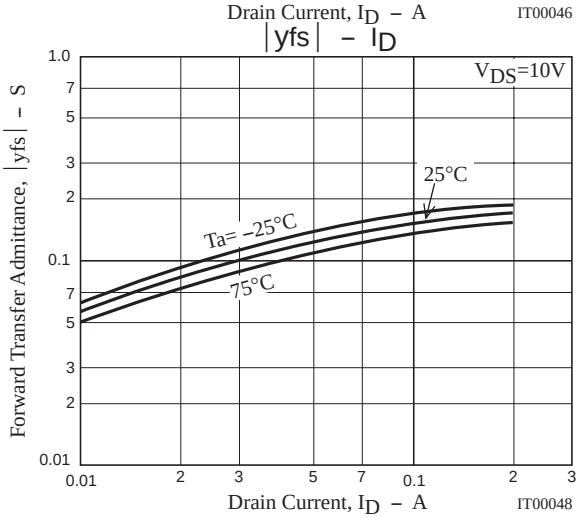


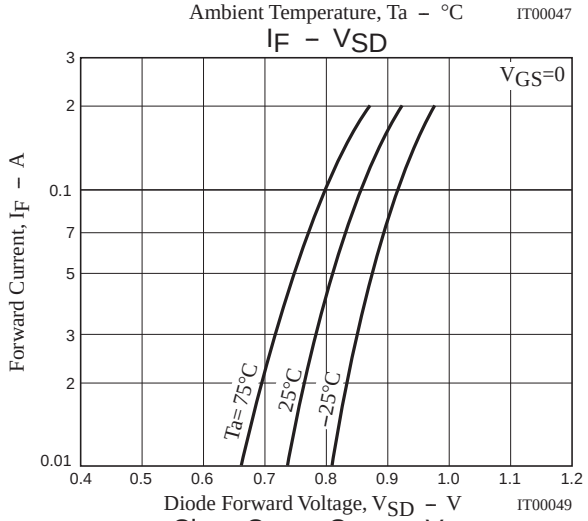


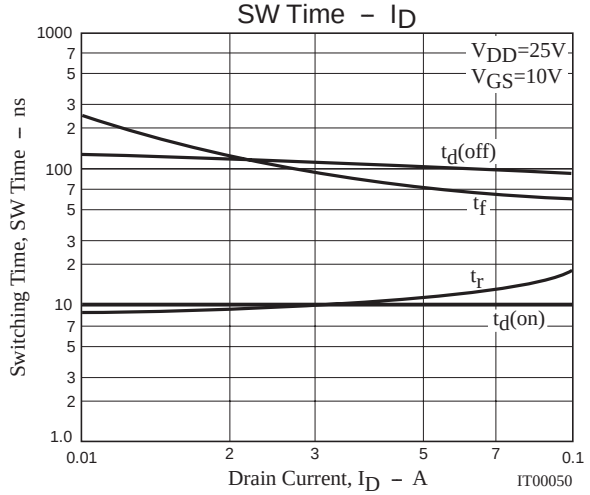


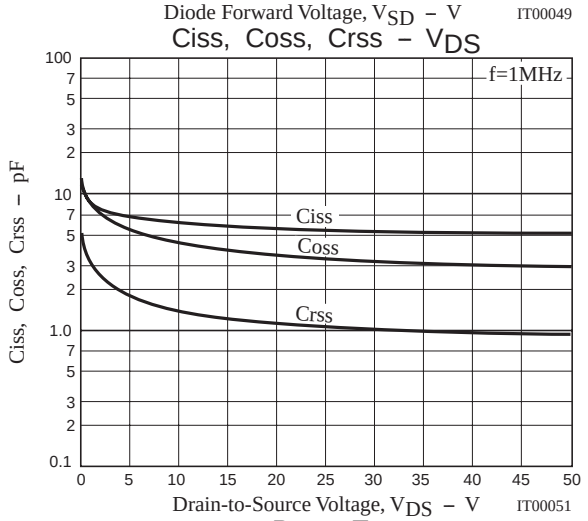

RDS(on) – ID
VGS=4V
25°C
Ta=75°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Drain Current, ID – A
IT00046

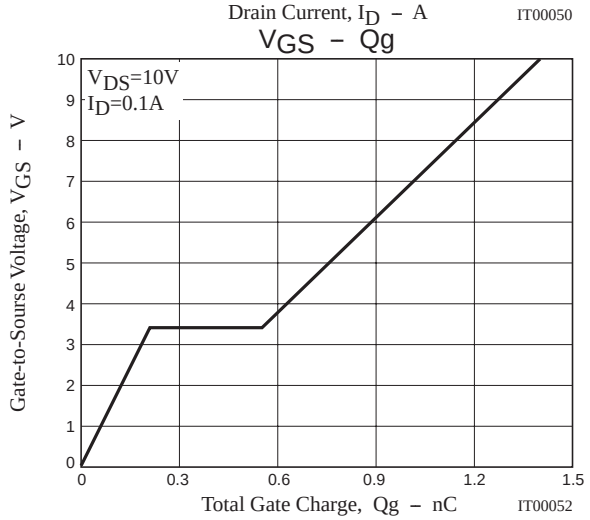

RDS(on) – Ta
ID=30mA, VGS=4V
ID=50mA, VGS=10V
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Ambient Temperature, Ta – °C
IT00047

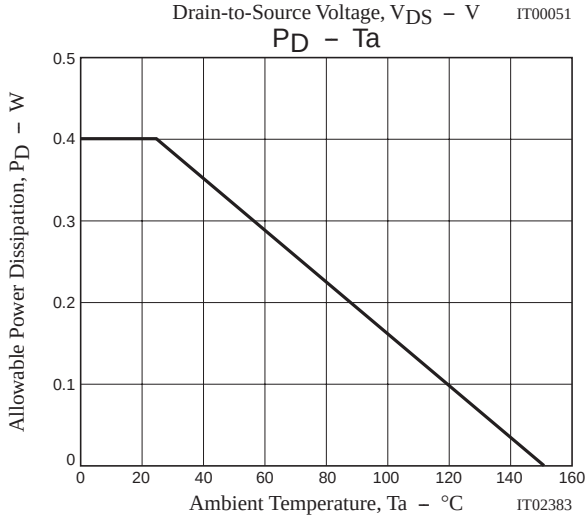

|yfs| – ID
VDS=10V
25°C
Ta= –25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT00048


IF – VSD
VGS=0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT00049


SW Time – ID
VDD=25V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT00050


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT00051


VGS – Qg
VDS=10V
ID=0.1A
Gate-to-Sourse Voltage, VGS – V
Total Gate Charge, Qg – nC
IT00052


PD – Ta
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT02383

Note on usage : Since the 5HN01N is designed for high-speed switching applications, please avoid using this device in the vicinity of highly charged objects.