Ordering number : ENN8221

SANYO Semiconductors
DATA SHEET

N-Channel Silicon MOSFET

MCH3420 — General-Purpose Switching Device Applications

Features

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

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		100	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		0.5	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	2	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (900mm²×0.8mm)	0.8	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	100			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V, V_{GS}=0			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	1.2		2.2	V
Forward Transfer Admittance	$\|yfs\|$	V_{DS}=10V, I_D=250mA	0.4	0.8		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=250mA, V_{GS}=10V		1.4	1.85	Ω
	R_{DS}(on)2	I_D=250mA, V_{GS}=4V		1.8	2.5	Ω
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		80		pF
Output Capacitance	Coss	V_{DS}=20V, f=1MHz		6.5		pF
Reverse Transfer Capacitance	Crss	V_{DS}=20V, f=1MHz		4		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		6		ns
Rise Time	t_r	See specified Test Circuit.		8		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		14		ns
Fall Time	t_f	See specified Test Circuit.		8		ns

Marking : KV

Continued on next page.

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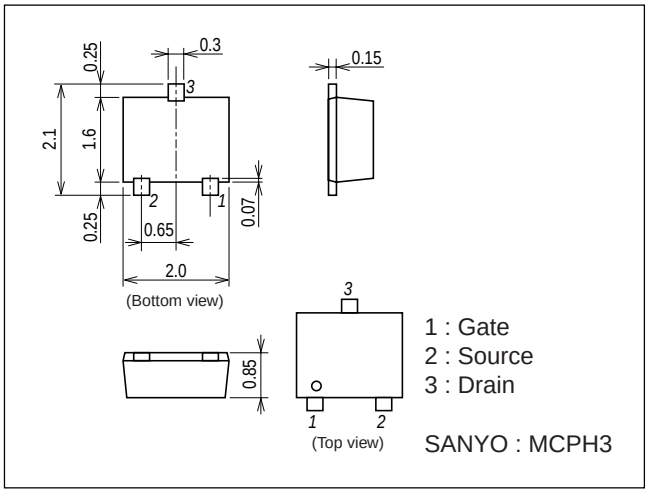
Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Total Gate Charge	Qg	V_{DS}=50V, V_{GS}=10V, I_D=0.5A		3.2		nC
Gate-to-Source Charge	Qgs	V_{DS}=50V, V_{GS}=10V, I_D=0.5A		0.6		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=50V, V_{GS}=10V, I_D=0.5A		0.6		nC
Diode Forward Voltage	V_{SD}	I_S=0.5A, V_{GS}=0		0.87	1.2	V

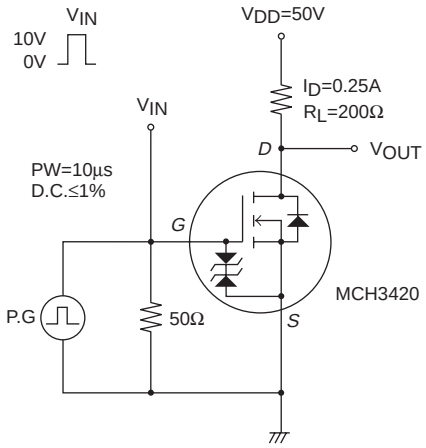
Package Dimensions

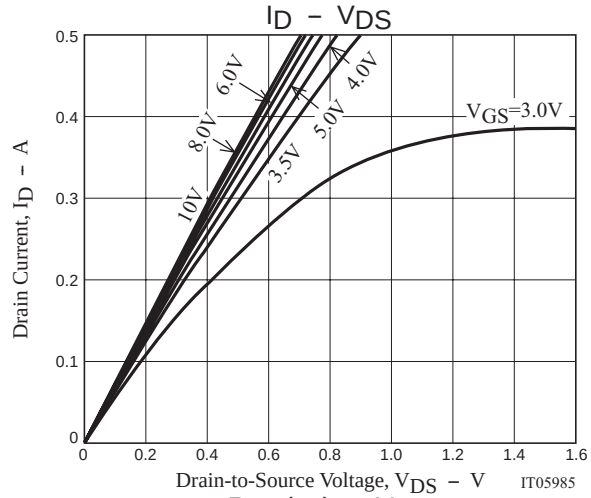
unit : mm

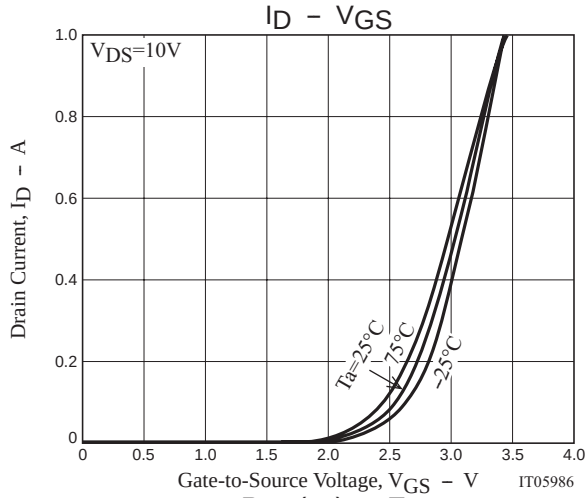
2167A

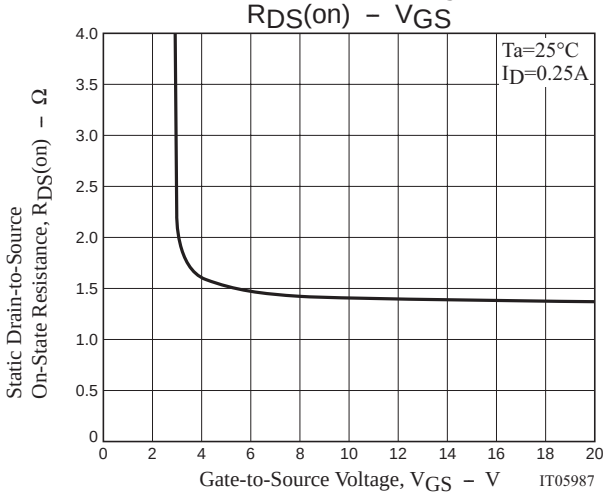


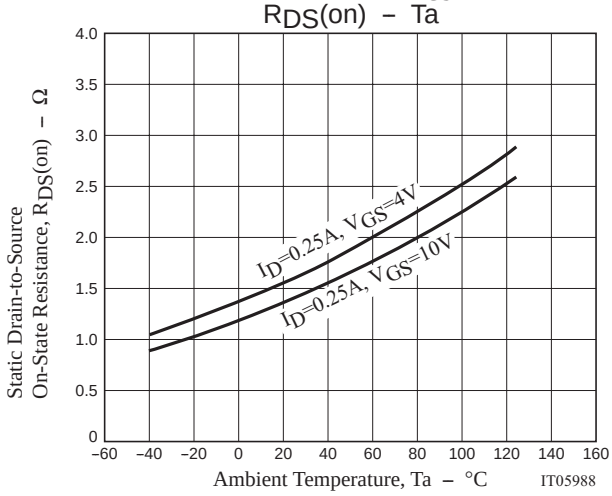
Switching Time Test Circuit

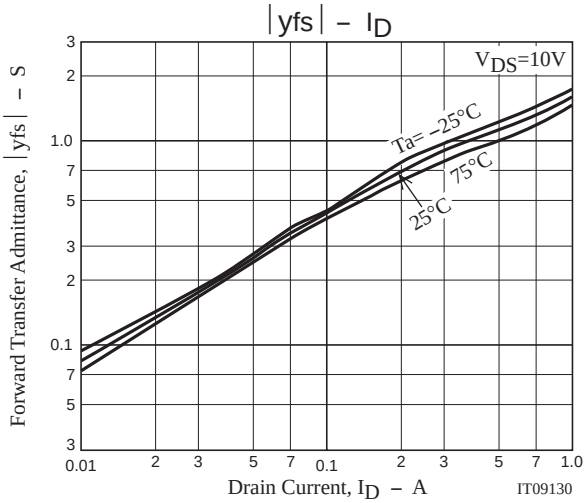


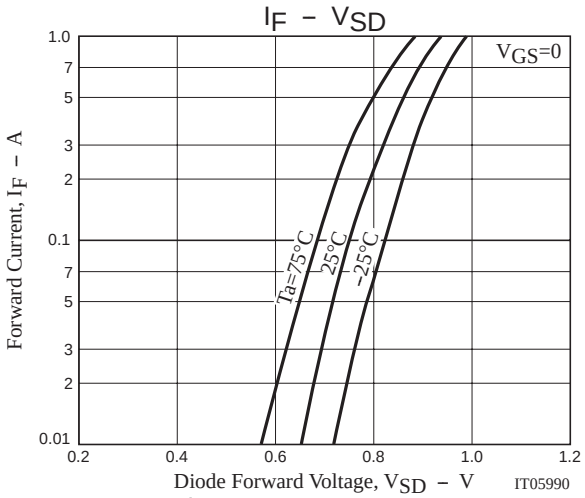


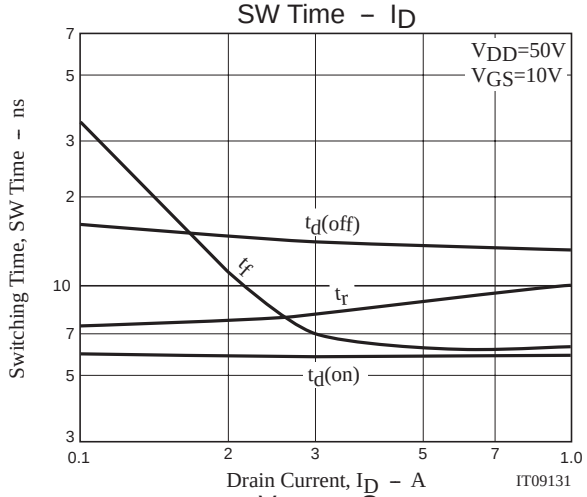


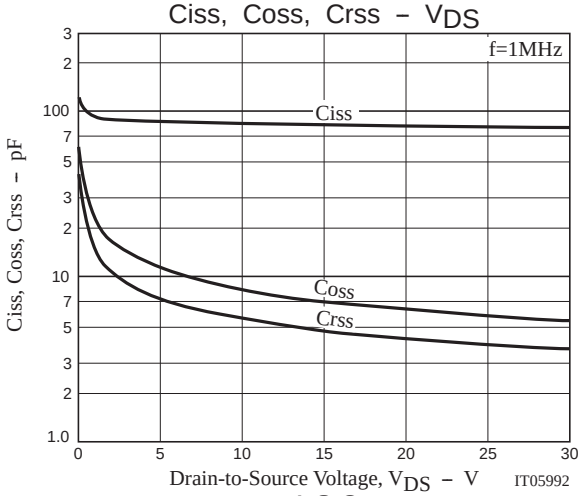


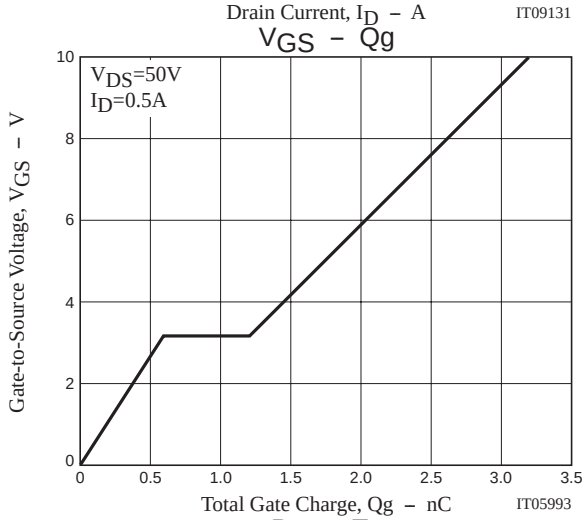


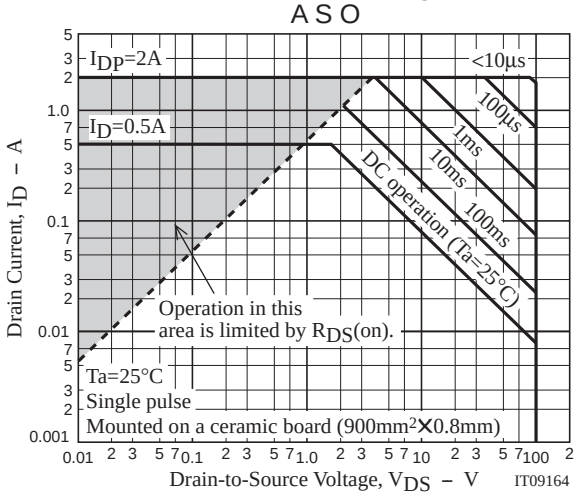

|yfs| – ID
VDS=10V
Ta= –25°C
75°C
25°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT09130

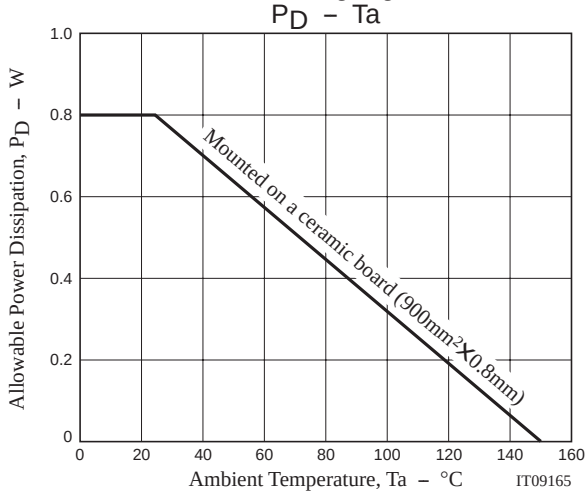

IF – VSD
VGS=0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT05990


SW Time – ID
VDD=50V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT09131


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT05992


VGS – Qg
VDS=50V
ID=0.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT05993


ASO
IDP=2A
ID=0.5A
<10μs
100μs
1ms
10ms
100ms
DC operation (Ta=25°C)
Operation in this
area is limited by RDS(on).
Ta=25°C
Single pulse
Mounted on a ceramic board (900mm²×0.8mm)
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT09164


PD – Ta
Mounted on a ceramic board (900mm²×0.8mm)
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT09165

Note on usage : Since the MCH3420 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.