Ordering number : ENN7997

ON Semiconductor®

ON Semiconductor
DATA SHEET

N-Channel Silicon MOSFET

MCH3421 — 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		0.8	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	3.2	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (900mm²×0.8mm)	0.9	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		2.6	V
Forward Transfer Admittance	$\|yfs\|$	V_{DS}=10V, I_D=400mA	0.5	1.0		S
Static Drain-to-Source On-State Resistance	$R_{DS}(on)1$	I_D=400mA, V_{GS}=10V		0.68	0.89	Ω
	$R_{DS}(on)2$	I_D=400mA, V_{GS}=4V		0.85	1.2	Ω
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		165		pF
Output Capacitance	Coss	V_{DS}=20V, f=1MHz		13		pF
Reverse Transfer Capacitance	Crss	V_{DS}=20V, f=1MHz		8.0		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		7		ns
Rise Time	t_r	See specified Test Circuit.		3		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit.		22		ns
Fall Time	t_f	See specified Test Circuit.		10		ns

Marking : KW

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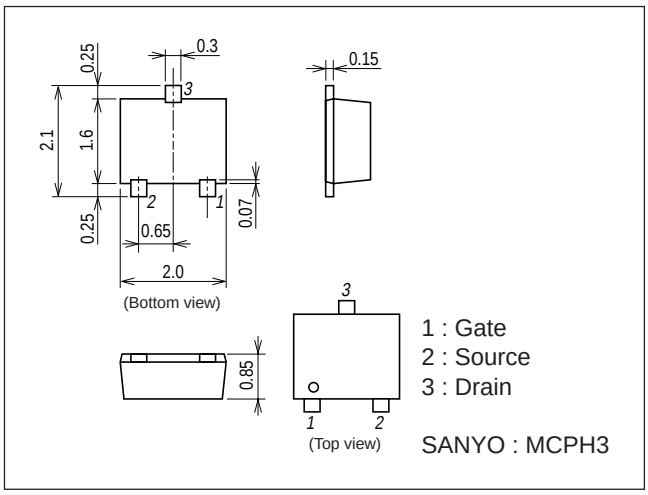
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Total Gate Charge	Qg	V_{DS}=50V, V_{GS}=10V, I_D=0.8A		4.8		nC
Gate-to-Source Charge	Qgs	V_{DS}=50V, V_{GS}=10V, I_D=0.8A		0.9		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=50V, V_{GS}=10V, I_D=0.8A		0.9		nC
Diode Forward Voltage	V_{SD}	I_S=0.8A, V_{GS}=0		0.86	1.2	V

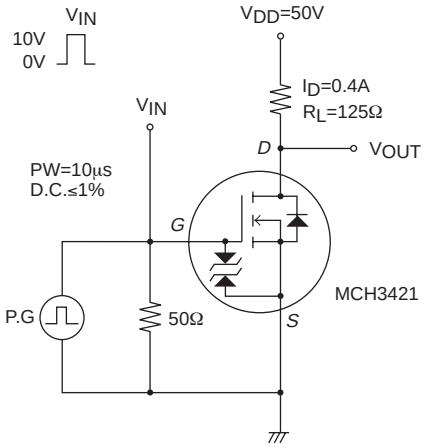
Package Dimensions

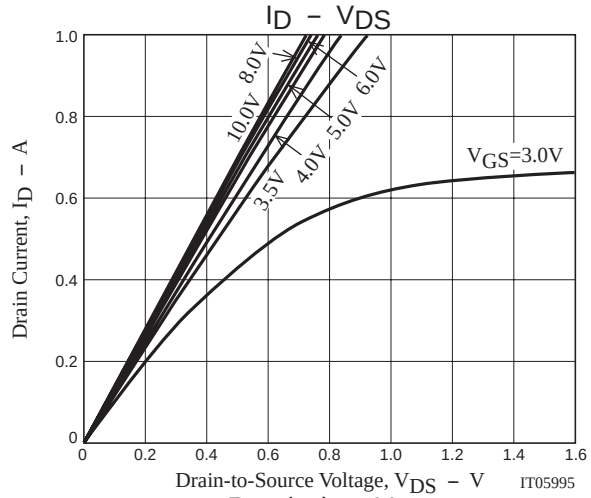
unit : mm

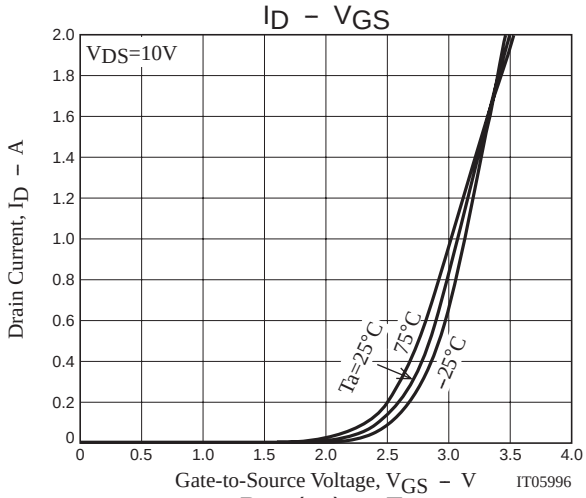
2167A

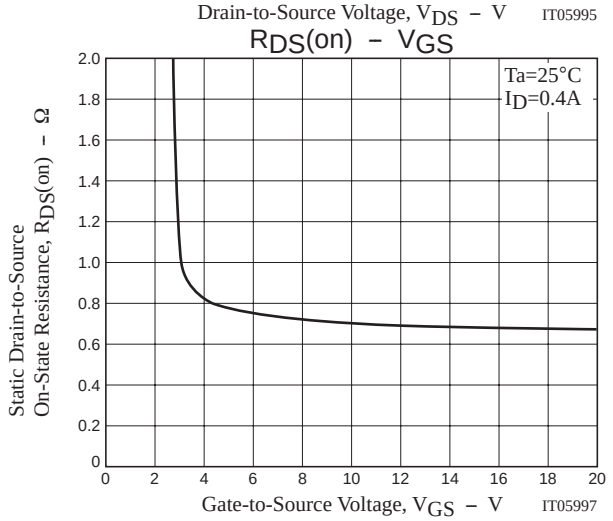


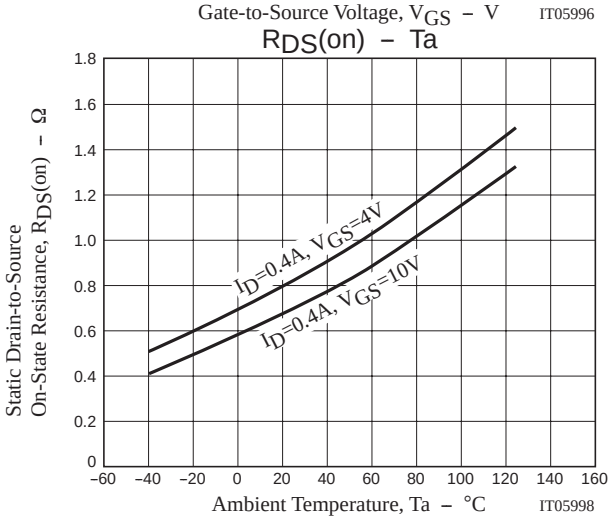
Switching Time Test Circuit

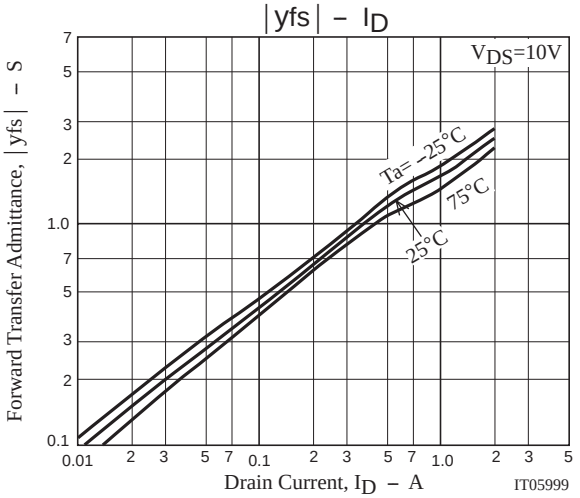


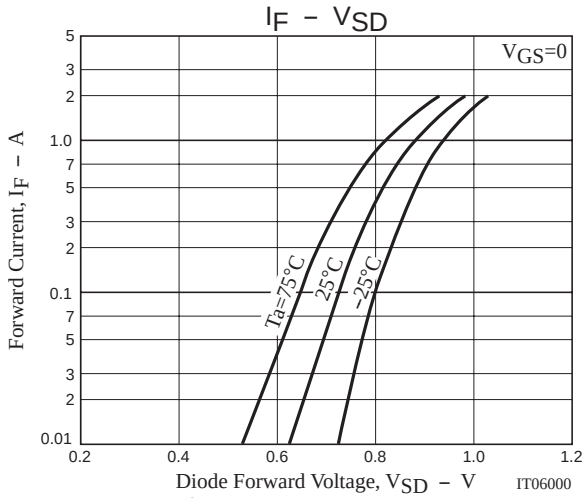


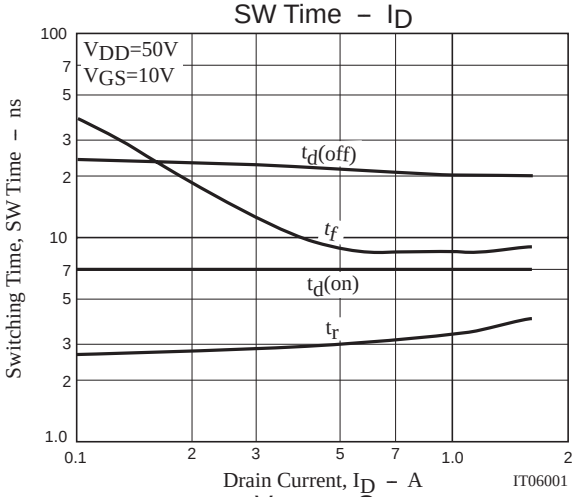


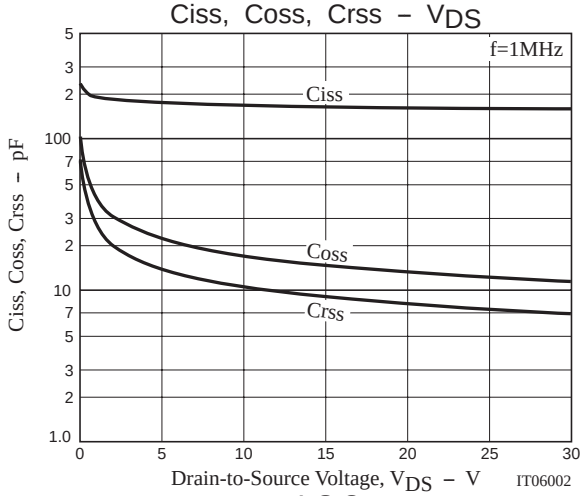


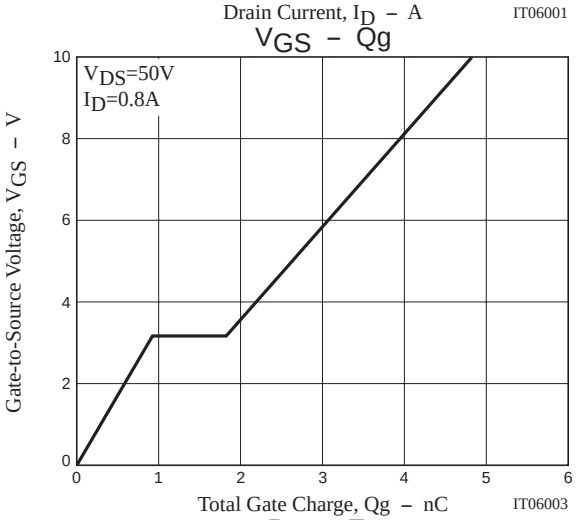


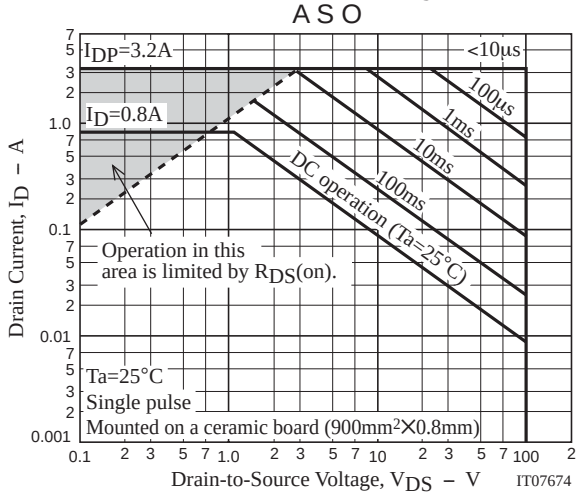

|yfs| – ID
VDS=10V
Ta= –25°C
75°C
25°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT05999

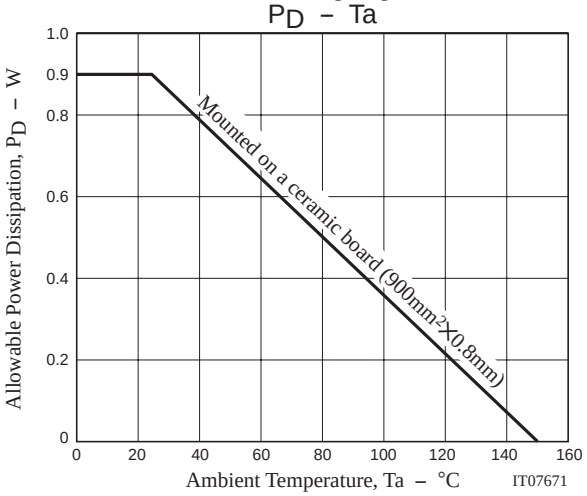

IF – VSD
VGS=0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT06000


SW Time – ID
VDD=50V
VGS=10V
td(off)
tf
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT06001


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT06002


VGS – Qg
VDS=50V
ID=0.8A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT06003


A S O
IDP=3.2A
ID=0.8A
<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
IT07674


PD – Ta
Mounted on a ceramic board (900mm²×0.8mm)
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT07671

PUBLICATION ORDERING INFORMATION

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