Ordering number : EN8025A

SANYO Semiconductors

DATA SHEET

N-Channel Silicon MOSFET

MCH3431 — General-Purpose Switching Device Applications

Features

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

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		30	V
Gate-to-Source Voltage	V_{GSS}		±12	V
Drain Current (DC)	I_D		3.5	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	14	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (900mm²X0.8mm)	1	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}=0V	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±10	μA
Cutoff Voltage	$V_{GS}(off)$	V_{DS}=10V, I_D=1mA	0.4		1.3	V
Forward Transfer Admittance	$\|yfs\|$	V_{DS}=10V, I_D=1.8A	2.8	4.8		S
Static Drain-to-Source On-State Resistance	$R_{DS}(on)1$	I_D=1.8A, V_{GS}=4V		55	72	mΩ
	$R_{DS}(on)2$	I_D=1A, V_{GS}=2.5V		70	98	mΩ

Marking : ZG

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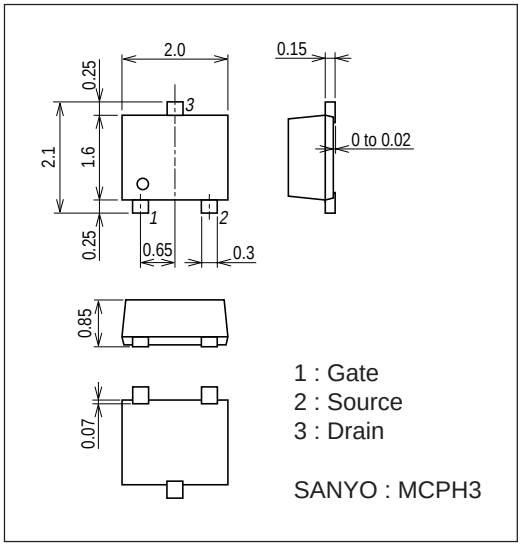
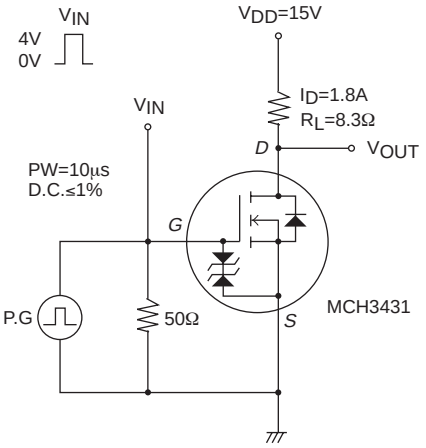
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		415		pF
Output Capacitance	Coss	V_{DS}=10V, f=1MHz		60		pF
Reverse Transfer Capacitance	Crss	V_{DS}=10V, f=1MHz		55		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		11		ns
Rise Time	t_r	See specified Test Circuit.		65		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		54		ns
Fall Time	t_f	See specified Test Circuit.		61		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=4V, I_D=3.5A		5.1		nC
Gate-to-Source Charge	Qgs	V_{DS}=10V, V_{GS}=4V, I_D=3.5A		0.95		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=10V, V_{GS}=4V, I_D=3.5A		1.4		nC
Diode Forward Voltage	V_{SD}	I_S=3.5A, V_{GS}=0V		0.87	1.2	V

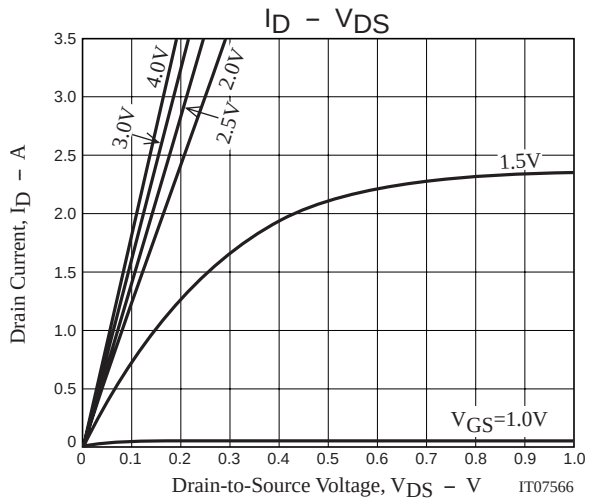
Package Dimensions

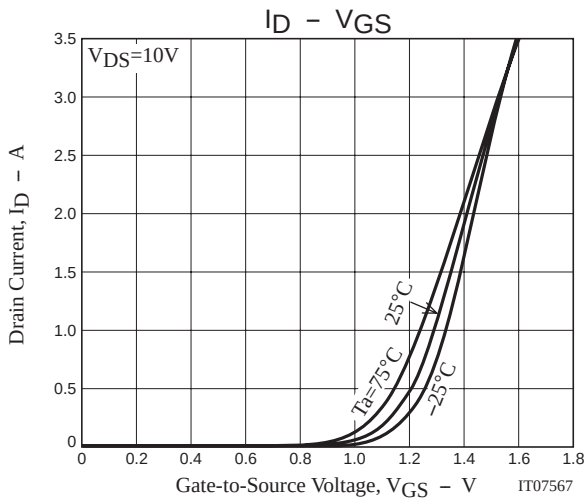
unit : mm (typ)
7019A-003

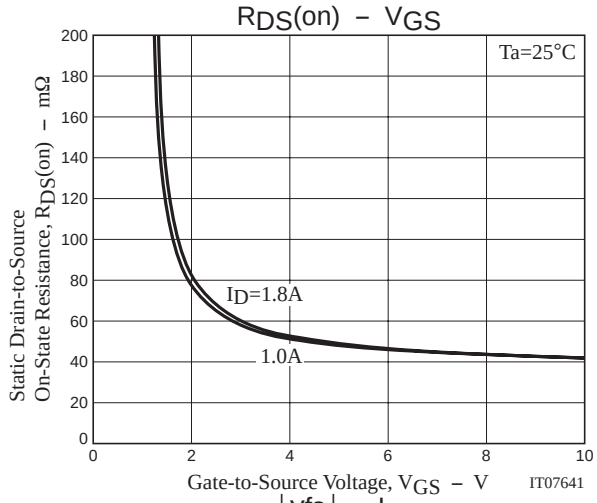


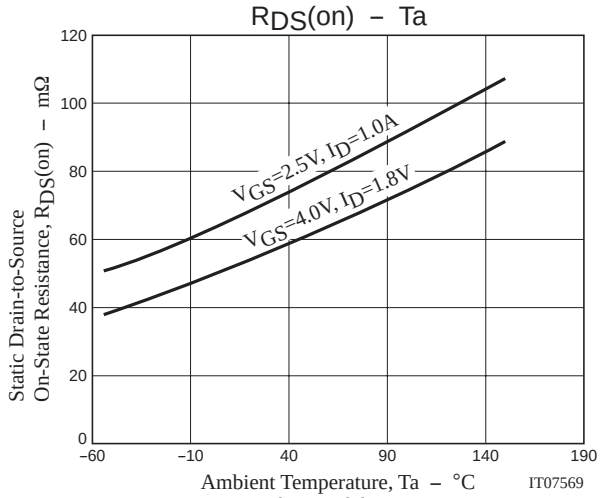
Switching Time Test Circuit

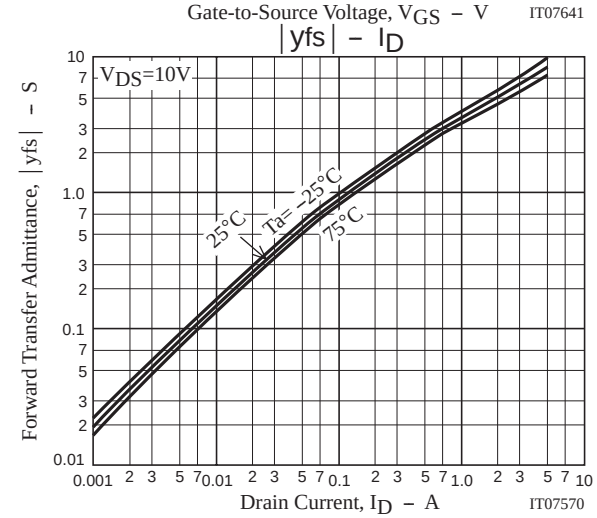


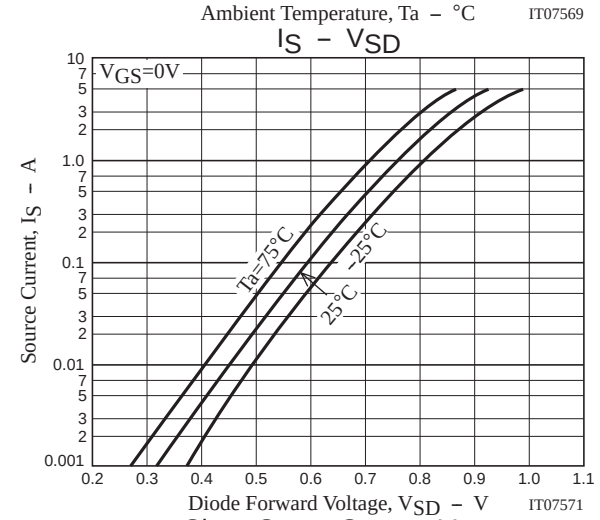


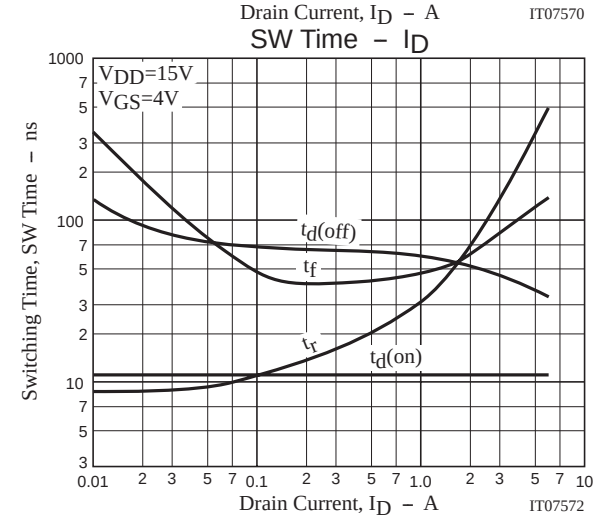


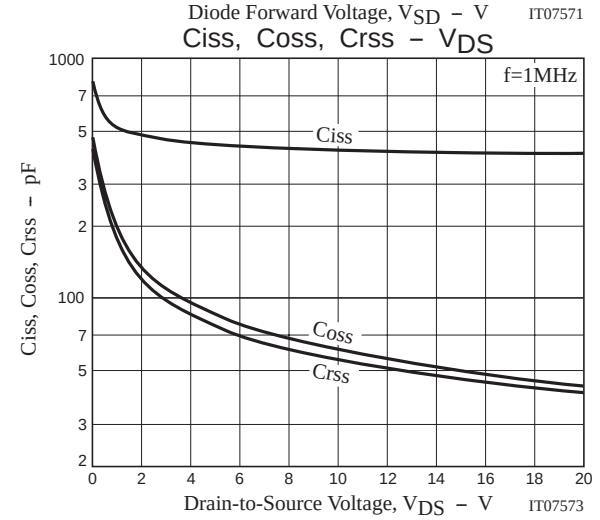

RDS(on) – VGS
Ta=25°C
ID=1.8A
1.0A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT07641

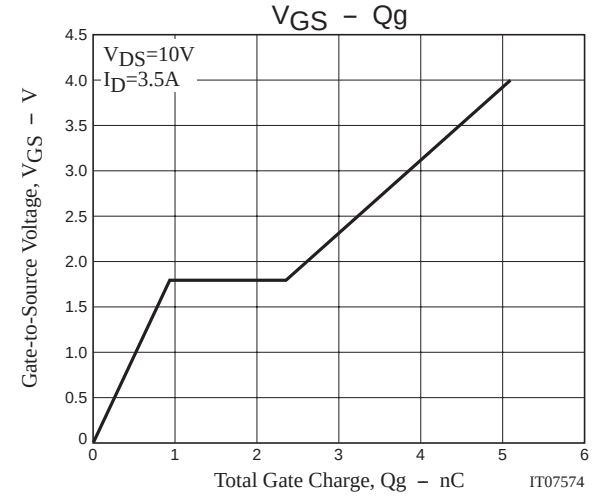

RDS(on) – Ta
VGS=2.5V, ID=1.0A
VGS=4.0V, ID=1.8V
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT07569

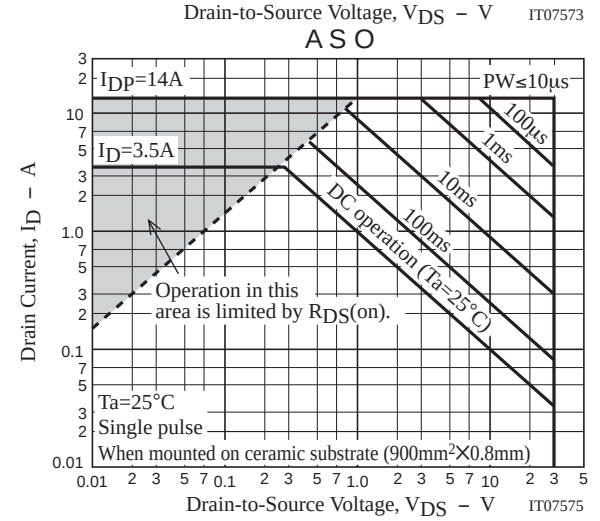

|yfs| – ID
VDS=10V
Ta=–25°C
25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT07570

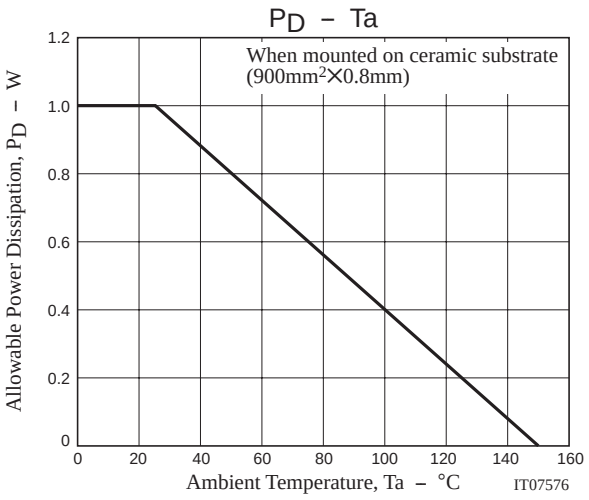

IS – VSD
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT07571


SW Time – ID
VDD=15V
VGS=4V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT07572


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT07573


VGS – Qg
VDS=10V
ID=3.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT07574


A S O
IDP=14A
PW≤10μs
ID=3.5A
100μs
1ms
10ms
100ms
DC operation (Ta=25°C)
Operation in this area is limited by RDS(on).
Ta=25°C
Single pulse
When mounted on ceramic substrate (900mm2×0.8mm)
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT07575



Note on usage : Since the MCH3431 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

This catalog provides information as of May, 2008. Specifications and information herein are subject to change without notice.