Ordering number : ENN7609

N-Channel Silicon MOSFET

ECH8401

Ultrahigh-Speed Switching Applications

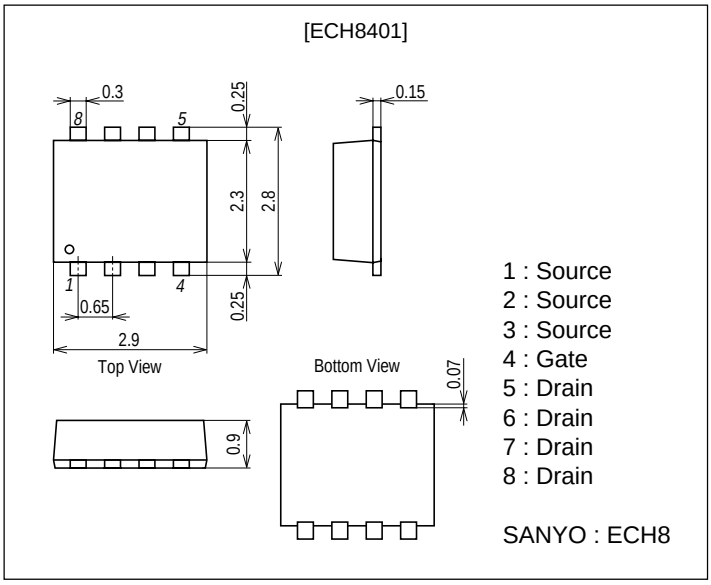
Features

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

Package Dimensions

unit : mm

2222



Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		20	V
Gate-to-Source Voltage	V_{GSS}		±12	V
Drain Current (DC)	I_D		10	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	40	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (900mm²×0.8mm)	1.6	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	20			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0			1	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=1mA	0.5		1.3	V

Marking : KA

Continued on next page.

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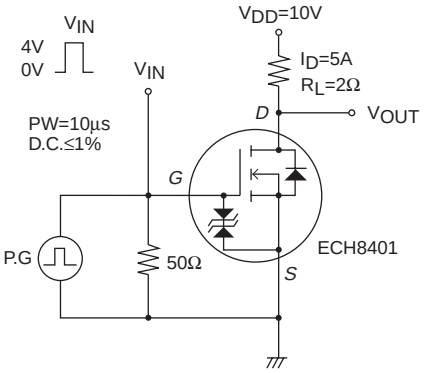
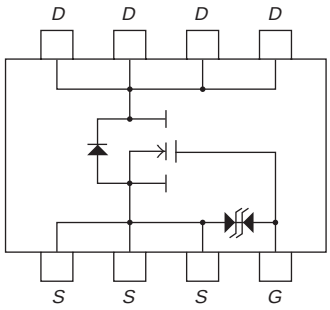
Continued from preceding page.

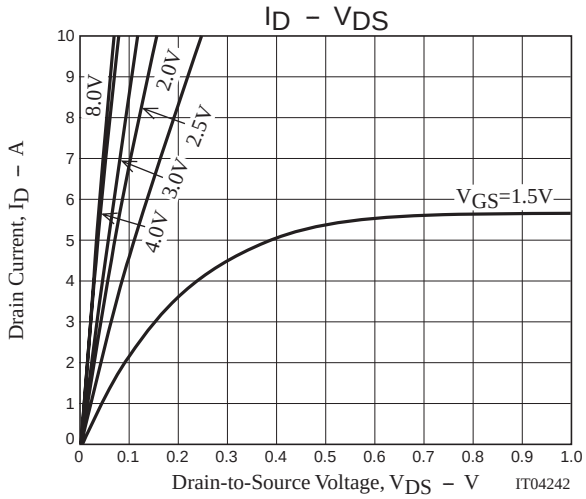
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Forward Transfer Admittance	|yfs|	V_{DS}=10V, I_D=5A	14	20		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=5A, V_{GS}=4V		9	14	mΩ
	R_{DS}(on)2	I_D=5A, V_{GS}=3.1V		10	15.5	mΩ
	R_{DS}(on)3	I_D=2A, V_{GS}=2.5V		12	19	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		1700		pF
Output Capacitance	Coss	V_{DS}=10V, f=1MHz		330		pF
Reverse Transfer Capacitance	Crss	V_{DS}=10V, f=1MHz		270		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit		29		ns
Rise Time	t_r	See specified Test Circuit		150		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit		220		ns
Fall Time	t_f	See specified Test Circuit		160		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=10V, I_D=5A		52		nC
Gate-to-Source Charge	Qgs	V_{DS}=10V, V_{GS}=10V, I_D=5A		2.6		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=10V, V_{GS}=10V, I_D=5A		7.4		nC
Diode Forward Voltage	V_{SD}	I_S=10A, V_{GS}=0		0.82	1.2	V

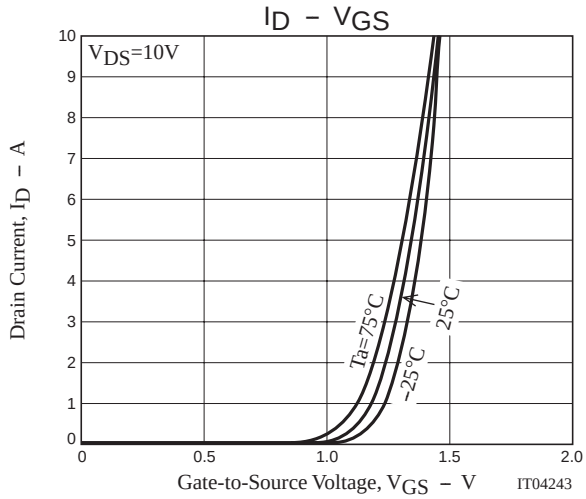
Switching Time Test Circuit

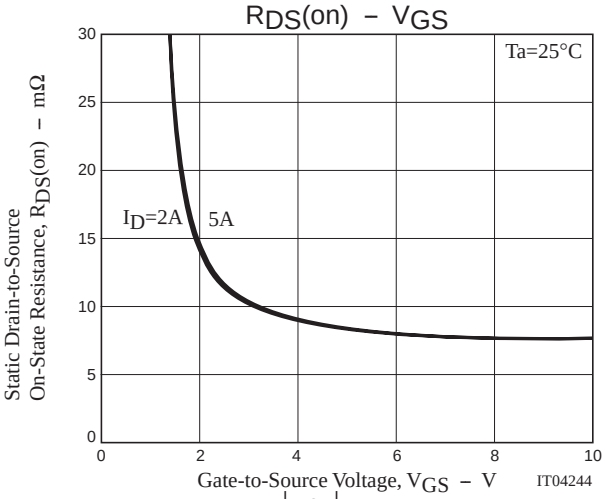


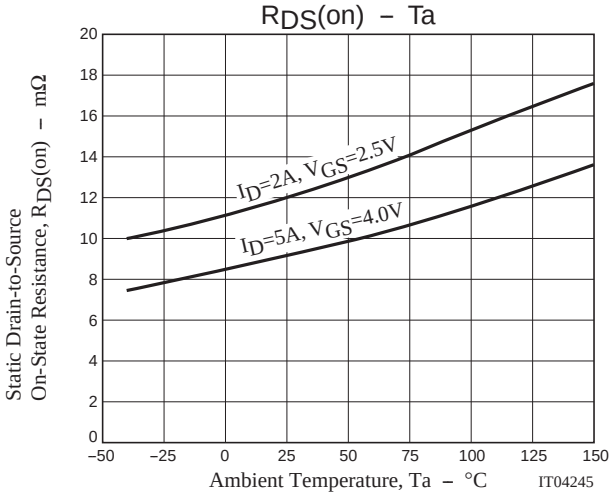
Electrical Connection

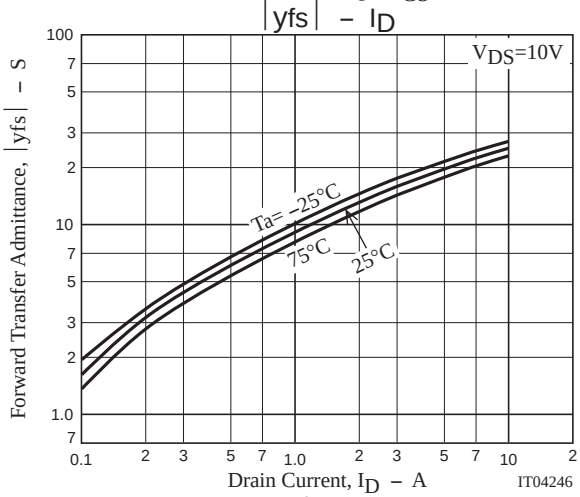


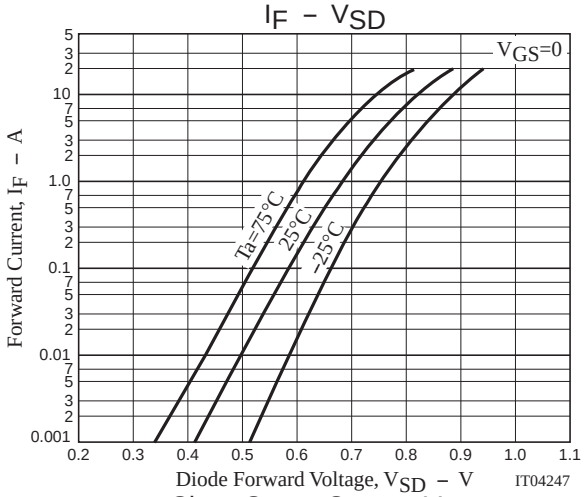


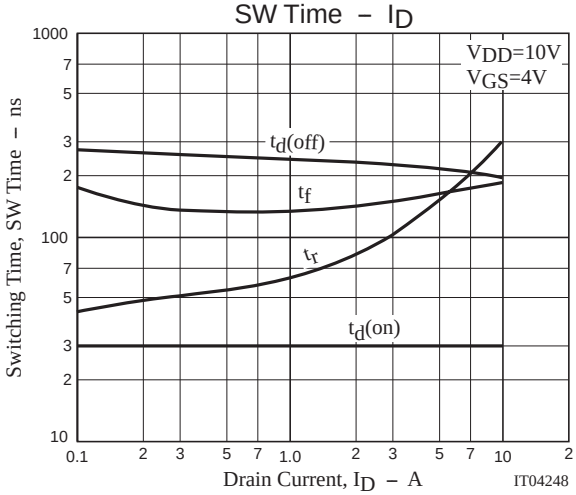


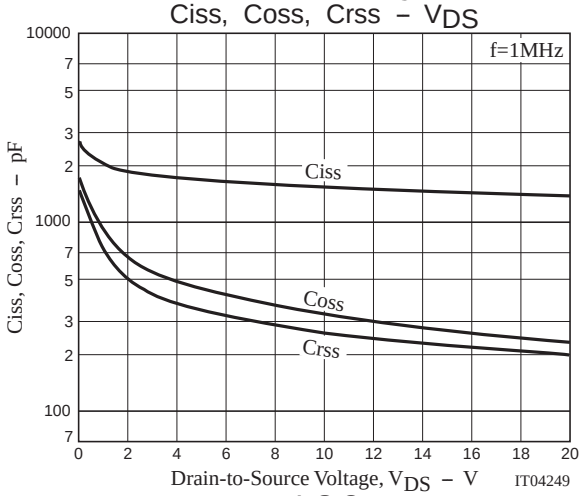

RDS(on) – VGS
Ta=25°C
ID=2A
5A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT04244

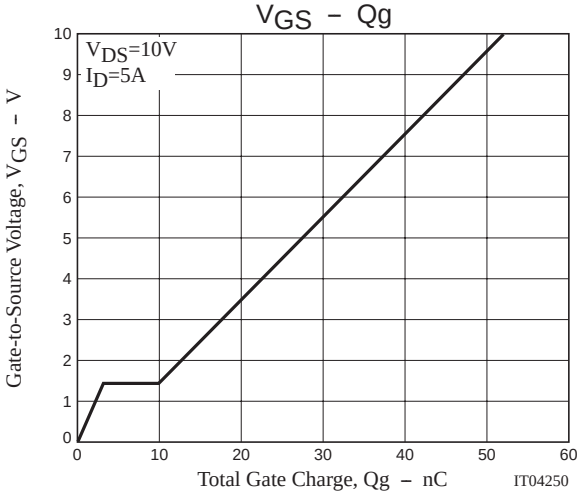

RDS(on) – Ta
ID=2A, VGS=2.5V
ID=5A, VGS=4.0V
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT04245

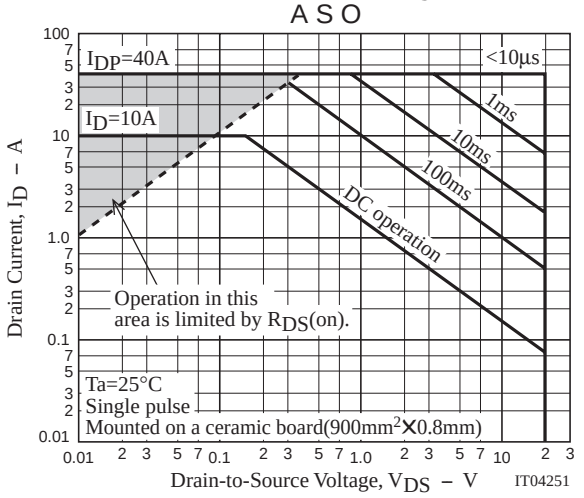

|yfs| – ID
VDS=10V
Ta= –25°C
75°C
25°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT04246


IF – VSD
VGS=0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT04247


SW Time – ID
VDD=10V
VGS=4V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT04248


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT04249


VGS – Qg
VDS=10V
ID=5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT04250


A S O
IDP=40A
<10μs
ID=10A
1ms
10ms
100ms
DC operation
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
IT04251