Ordering number : ENN8148

SANYO Semiconductors
DATA SHEET

N-Channel Silicon MOSFET

ECH8402 — General-Purpose Switching Device Applications

Features

- Low ON-resistance.
- 4V 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}		±20	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	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, 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	1.0		2.4	V
Forward Transfer Admittance	$\|yfs\|$	V_{DS}=10V, I_D=5A	5.6	9.4		S
Static Drain-to-Source On-State Resistance	$R_{DS}(on)1$	I_D=5A, V_{GS}=10V		11	15	mΩ
	$R_{DS}(on)2$	I_D=2.5A, V_{GS}=4V		23	32	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		1400		pF
Output Capacitance	Coss	V_{DS}=10V, f=1MHz		270		pF
Reverse Transfer Capacitance	Crss	V_{DS}=10V, f=1MHz		190		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		17		ns
Rise Time	t_r	See specified Test Circuit.		82		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit.		96		ns
Fall Time	t_f	See specified Test Circuit.		53		ns

Marking : KB

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

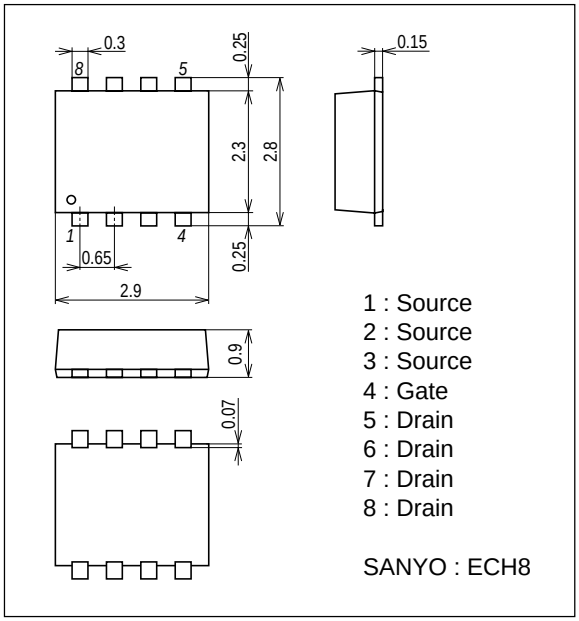
Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=10V, I_D=5A		28		nC
Gate-to-Source Charge	Qgs	V_{DS}=10V, V_{GS}=10V, I_D=5A		4.8		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=10V, V_{GS}=10V, I_D=5A		7.3		nC
Diode Forward Voltage	V_{SD}	I_S=10A, V_{GS}=0		0.81	1.2	V

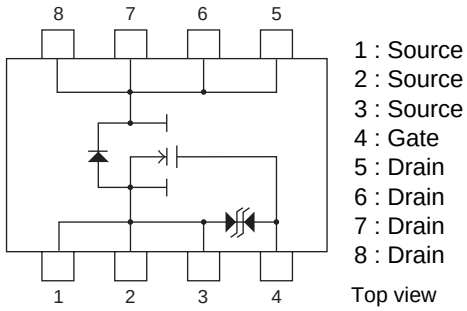
Package Dimensions

unit : mm

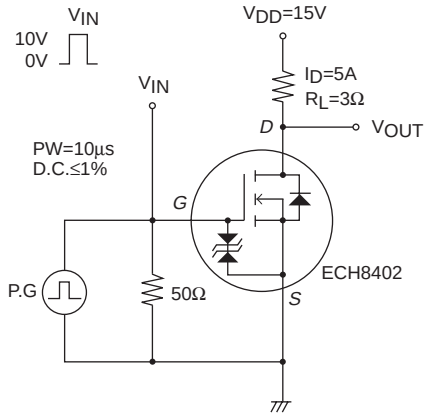
2222A

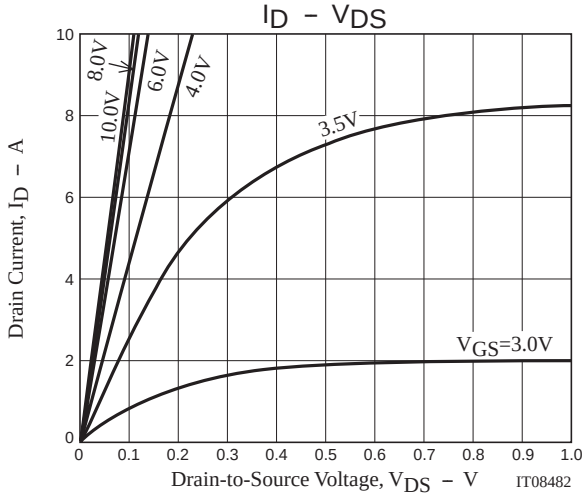


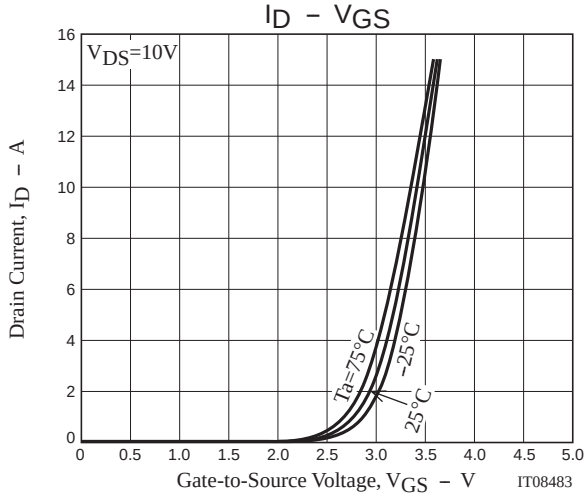
Electrical Connection

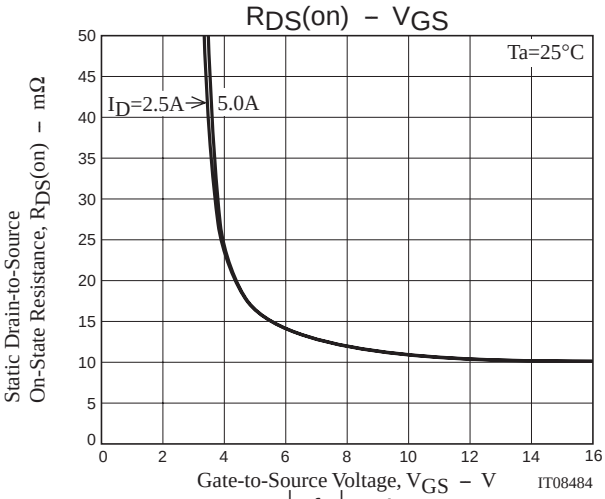


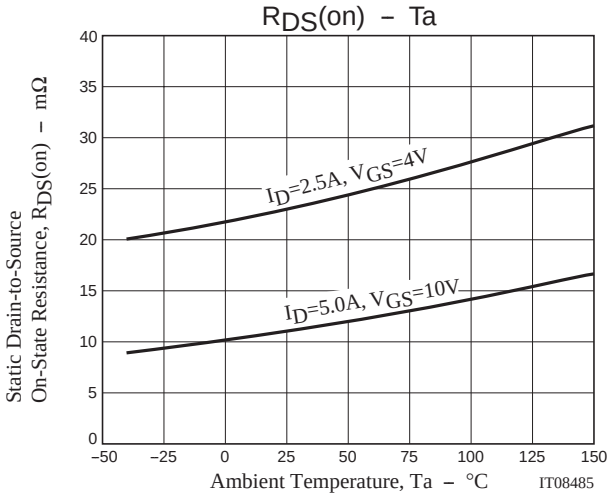
Switching Time Test Circuit

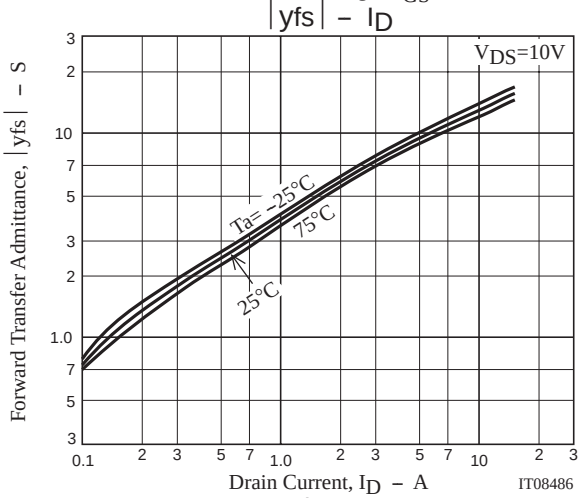


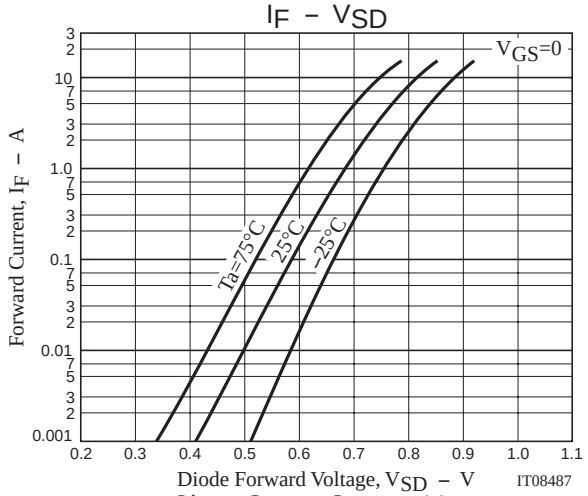


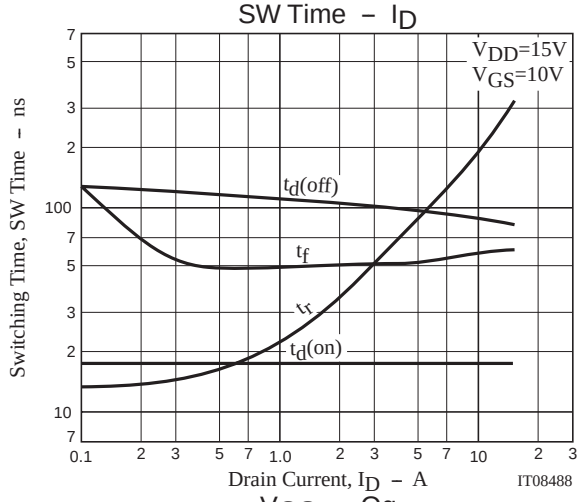


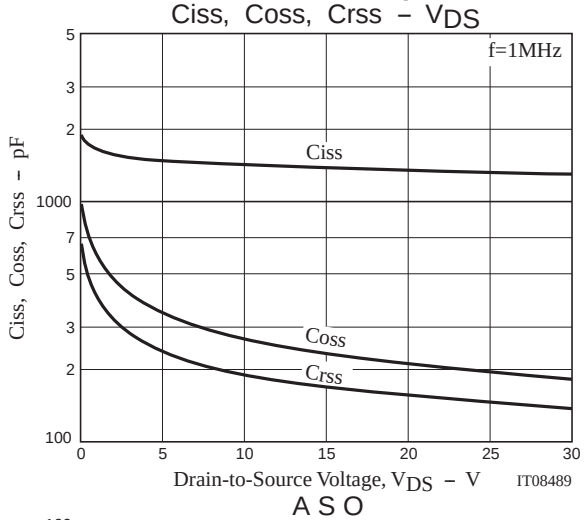

RDS(on) – VGS
Ta=25°C
ID=2.5A
5.0A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT08484

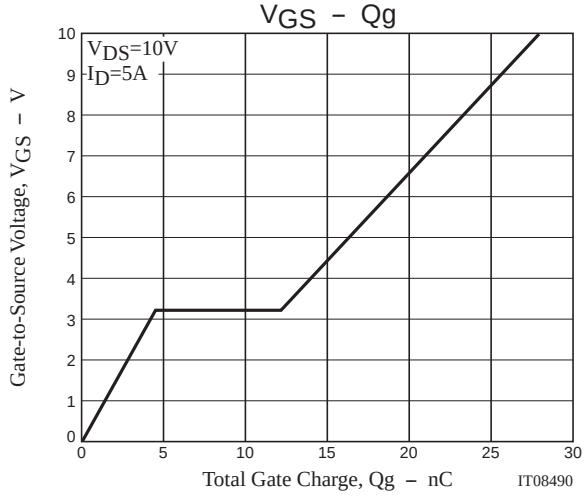

RDS(on) – Ta
ID=2.5A, VGS=4V
ID=5.0A, VGS=10V
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT08485

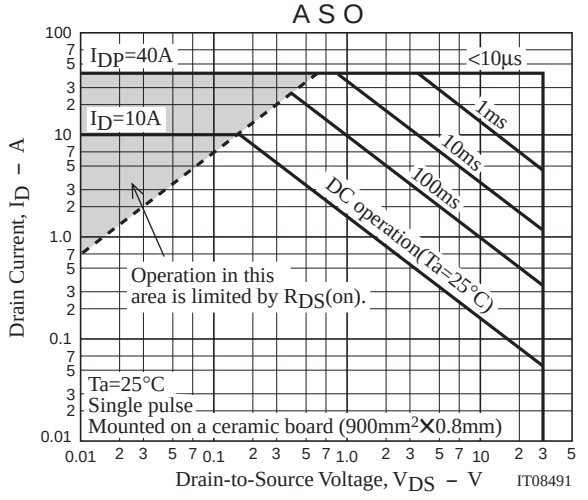

|yfs| – ID
VDS=10V
Ta=–25°C
75°C
25°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT08486

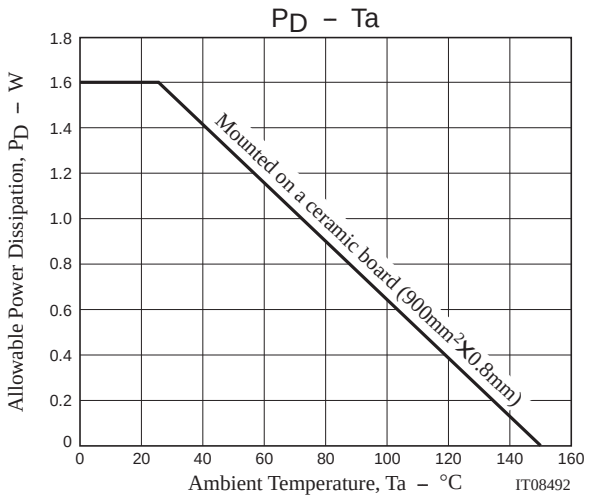

IF – VSD
VGS=0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT08487


SW Time – ID
VDD=15V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT08488


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT08489


VGS – Qg
VDS=10V
ID=5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT08490


A S O
IDP=40A
<10μs
ID=10A
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
IT08491



Note on usage : Since the ECH8402 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.