Ordering number : ENN8274

SANYO Semiconductors

DATA SHEET

P-Channel Silicon MOSFET

ECH8631 — General-Purpose Switching Device Applications

Features

- Low ON-resistance.
- 2.5V drive.
- Composite type, facilitating high-density mounting.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		−12	V
Gate-to-Source Voltage	V_{GSS}		±10	V
Drain Current (DC)	I_D		−5	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) 1unit	1.3	W
Total Power Dissipation	P_T	Mounted on a ceramic board (900mm²×0.8mm)	1.5	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	−12			V
Zero-Gate Voltage Drain Current	$I_{DSS}1$	V_{DS}=−4V, V_{GS}=0			−1	μA
	$I_{DSS}2$	V_{DS}=−12V, V_{GS}=0			−10	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=−6V, I_D=−1mA	−0.4		−1.4	V
Forward Transfer Admittance	$\|yfs\|$	V_{DS}=−6V, I_D=−2.5A	5.5	9.3		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=−2A, V_{GS}=−5V		24	30	mΩ
	R_{DS}(on)2	I_D=−1A, V_{GS}=−4.5V		26	34	mΩ
	R_{DS}(on)3	I_D=−0.5A, V_{GS}=−2.5V		42	56	mΩ
Input Capacitance	Ciss	V_{DS}=−6V, f=1MHz		1720		pF
Output Capacitance	Coss	V_{DS}=−6V, f=1MHz		762		pF
Reverse Transfer Capacitance	Crss	V_{DS}=−6V, f=1MHz		720		pF

Marking : FZ

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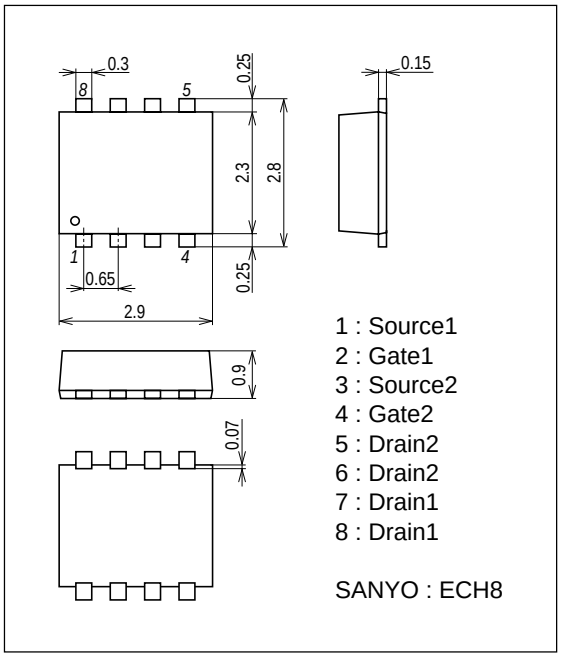
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		20		ns
Rise Time	t_r	See specified Test Circuit.		129		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		181		ns
Fall Time	t_f	See specified Test Circuit.		239		ns
Total Gate Charge	Qg	V_{DS}=-6V, V_{GS}=-5V, I_D=-5A		19.6		nC
Gate-to-Source Charge	Qgs	V_{DS}=-6V, V_{GS}=-5V, I_D=-5A		3.64		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=-6V, V_{GS}=-5V, I_D=-5A		5.82		nC
Diode Forward Voltage	V_{SD}	I_S=-5A, V_{GS}=0		-0.83	-1.5	V

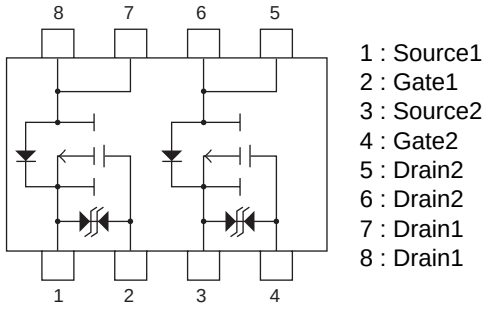
Package Dimensions

unit : mm

2206B

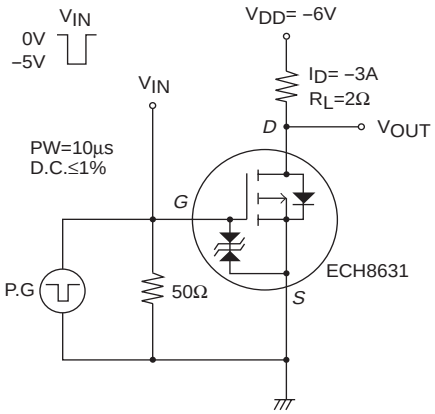


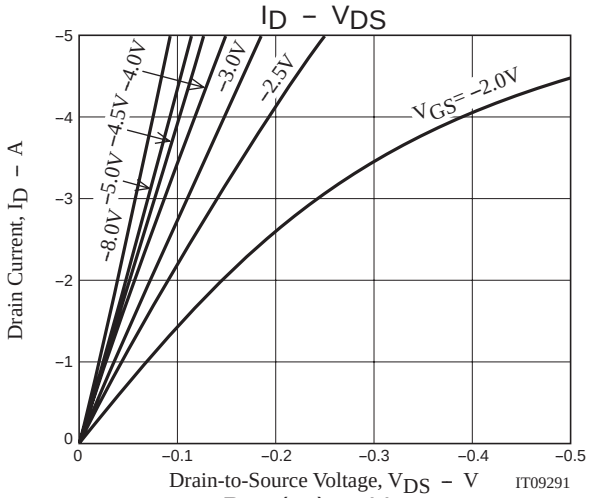
Electrical Connection

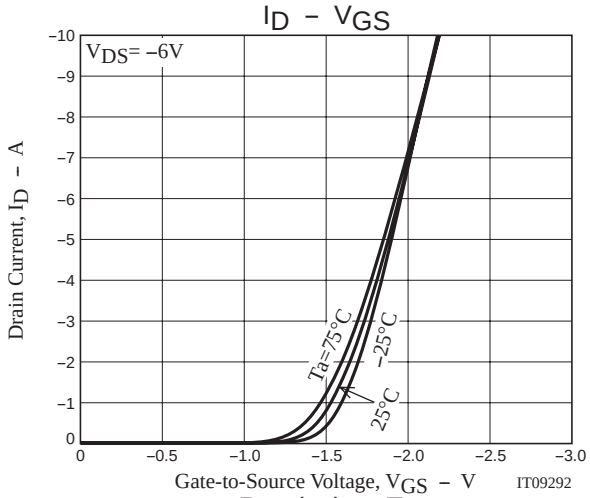


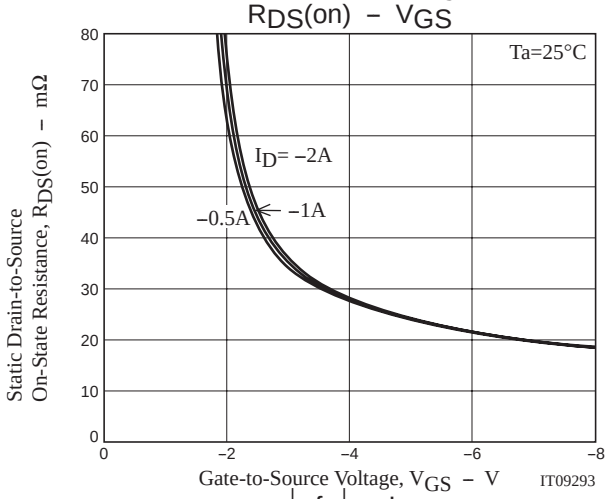
Top view

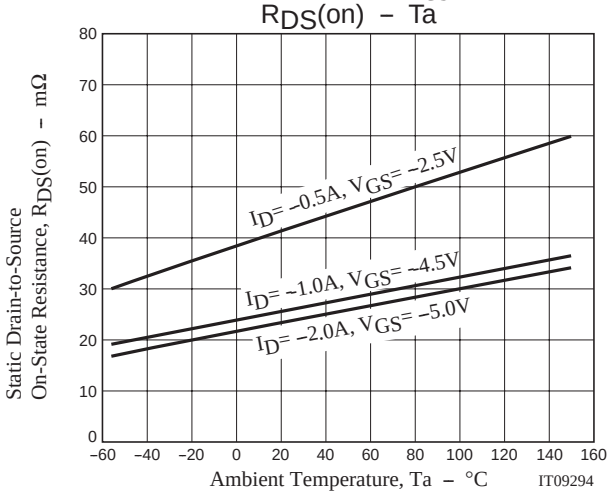
Switching Time Test Circuit

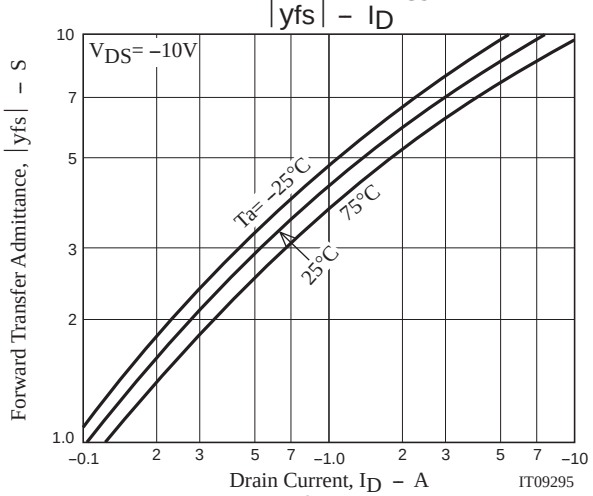


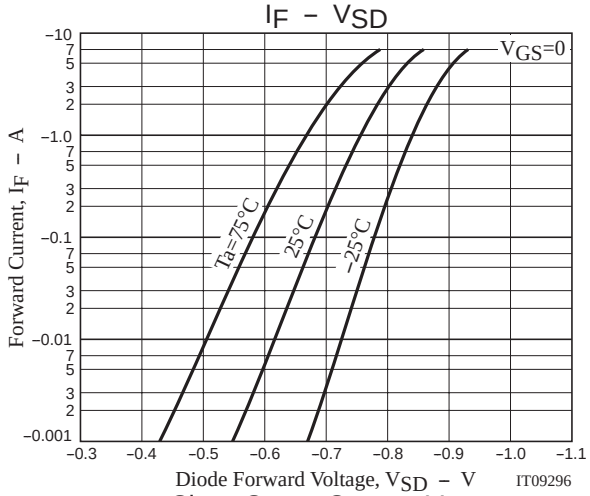

ID – VDS
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT09291
VGS= –2.0V
–2.5V
–3.0V
–4.0V
–4.5V
–5.0V
–8.0V

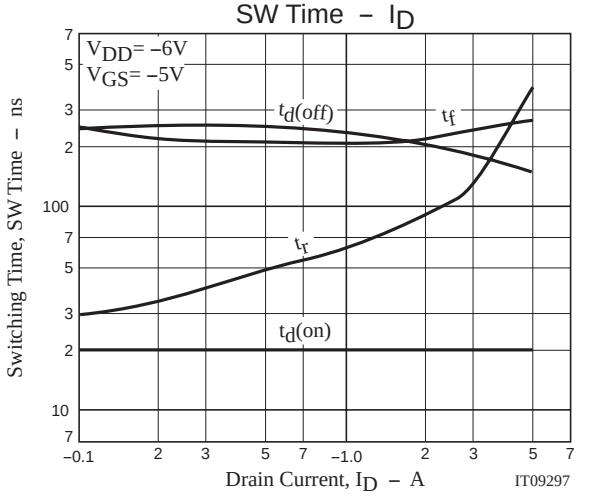

ID – VGS
VDS= –6V
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT09292
Ta=75°C
25°C
–25°C

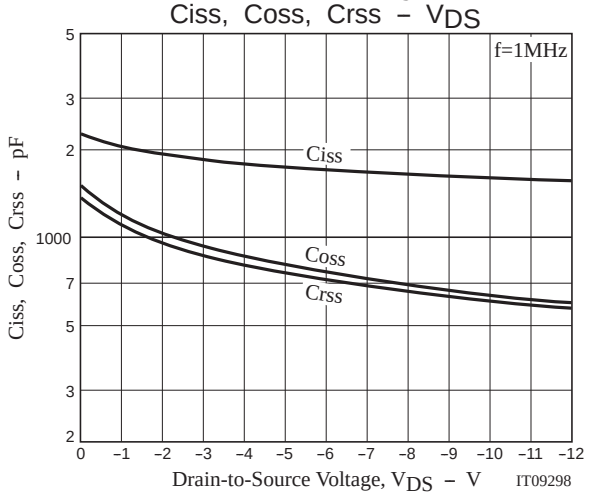

RDS(on) – VGS
Ta=25°C
Static Drain-to-Source
On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT09293
ID= –2A
–1A
–0.5A

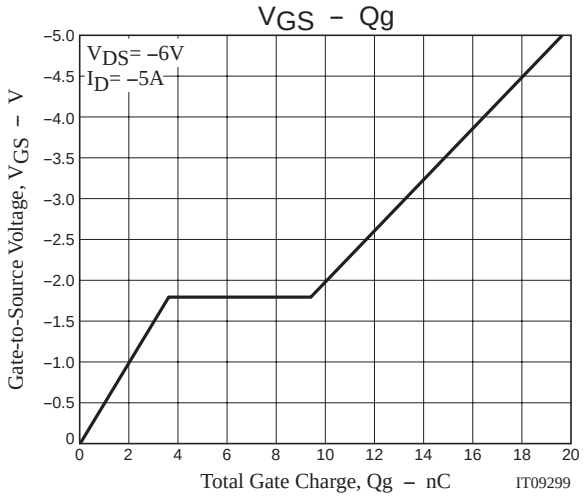

RDS(on) – Ta
Static Drain-to-Source
On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT09294
ID= –0.5A, VGS= –2.5V
ID= –1.0A, VGS= –4.5V
ID= –2.0A, VGS= –5.0V

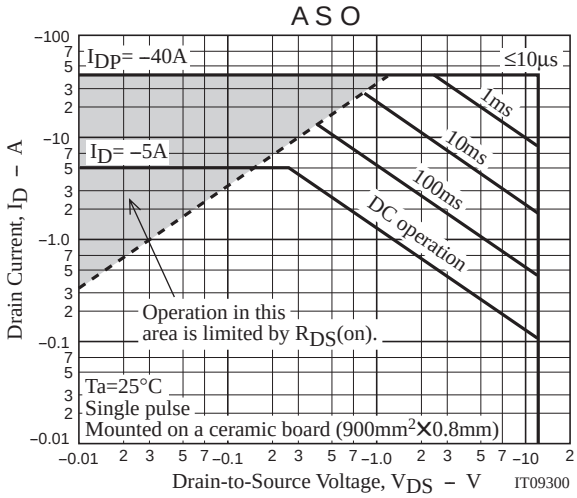

| yfs | – ID
VDS= –10V
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT09295
Ta= –25°C
75°C
25°C

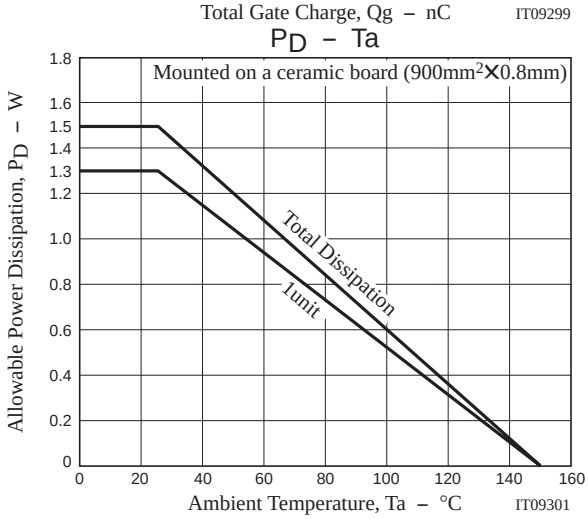

IF – VSD
VGS=0
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT09296
Ta=75°C
25°C
–25°C


SW Time – ID
VDD= –6V
VGS= –5V
Switching Time, SW Time – ns
Drain Current, ID – A
IT09297
td(off)
tf
tr
td(on)


Ciss, Coss, Crss – VDS
f=1MHz
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT09298
Ciss
Coss
Crss







Note on usage : Since the ECH8631 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.