Ordering number : ENN7780

SANYO Semiconductors
DATA SHEET

ECH8613 — P-Channel Silicon MOSFET
High-Speed Switching Applications

Features

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

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 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		26	33	mΩ
	R_{DS}(on)2	I_D=-1A, V_{GS}=-4.5V		28	37	mΩ
	R_{DS}(on)3	I_D=-0.5A, V_{GS}=-2.5V		43	60	mΩ
Input Capacitance	Ciss	V_{DS}=-6V, f=1MHz		1165		pF
Output Capacitance	Coss	V_{DS}=-6V, f=1MHz		320		pF
Reverse Transfer Capacitance	Crss	V_{DS}=-6V, f=1MHz		265		pF

Marking : FF

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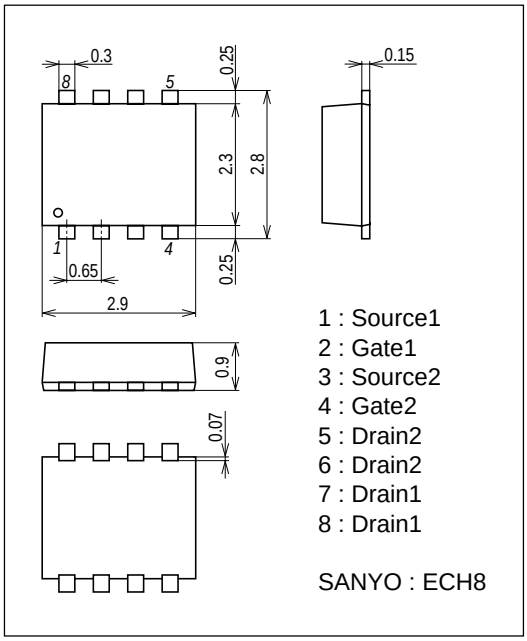
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		12		ns
Rise Time	t_r	See specified Test Circuit.		340		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		100		ns
Fall Time	t_f	See specified Test Circuit.		130		ns
Total Gate Charge	Qg	V_{DS}=-6V, V_{GS}=-5V, I_D=-5A		9.5		nC
Gate-to-Source Charge	Qgs	V_{DS}=-6V, V_{GS}=-5V, I_D=-5A		2.1		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=-6V, V_{GS}=-5V, I_D=-5A		1.4		nC
Diode Forward Voltage	V_{SD}	I_S=-5A, V_{GS}=0		0.83	-1.5	V

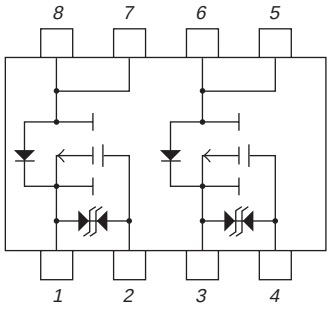
Package Dimensions

unit : mm

2206B



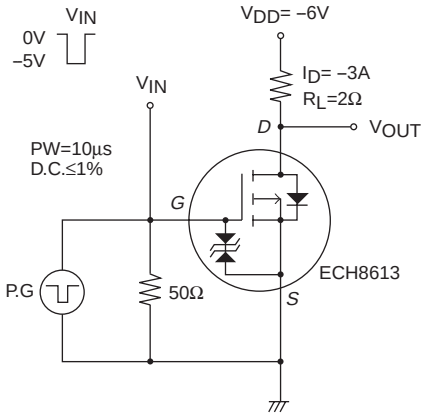
Electrical Connection

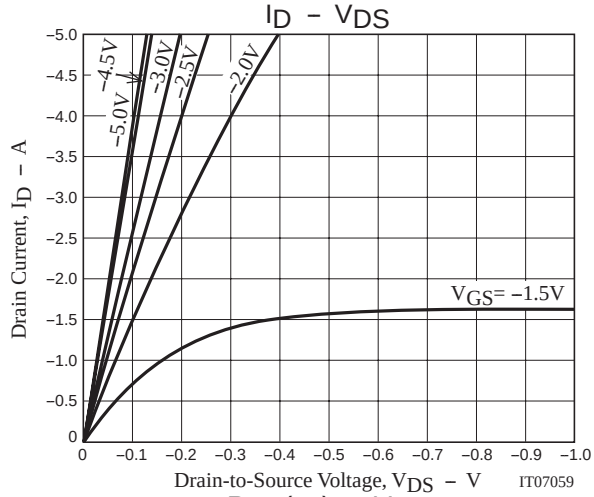


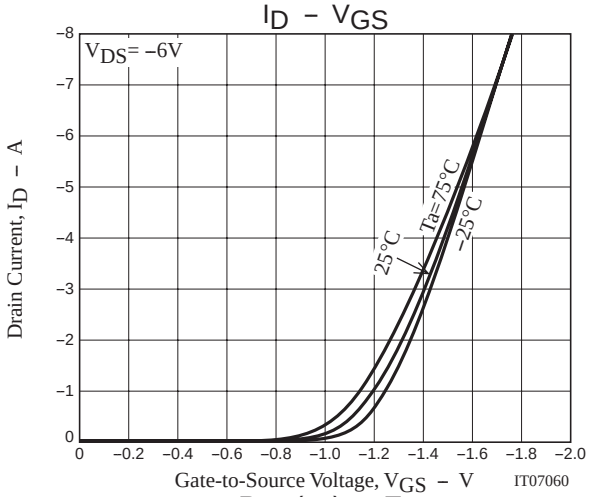
1 : Source1
2 : Gate1
3 : Source2
4 : Gate2
5 : Drain2
6 : Drain2
7 : Drain1
8 : Drain1

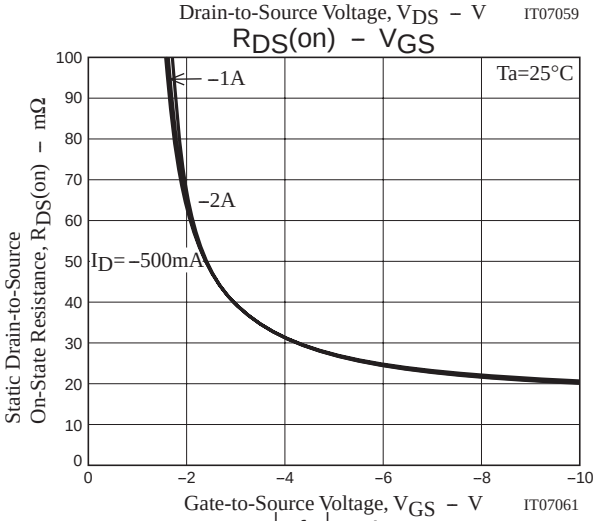
Top view

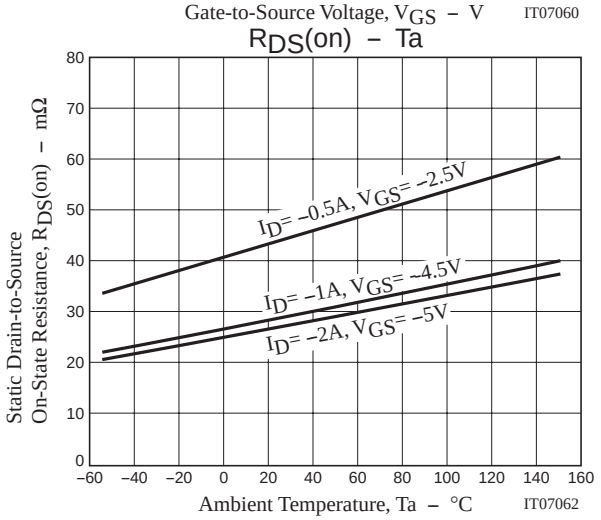
Switching Time Test Circuit

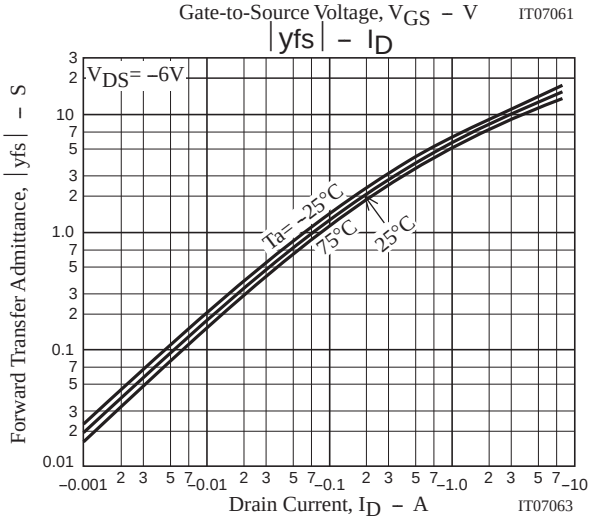


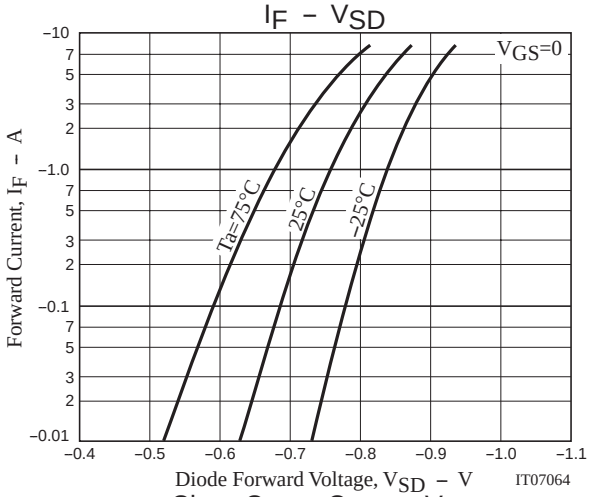

ID – VDS
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT07059
–4.5V
–5.0V
–3.0V
–2.5V
–2.0V
VGS= –1.5V

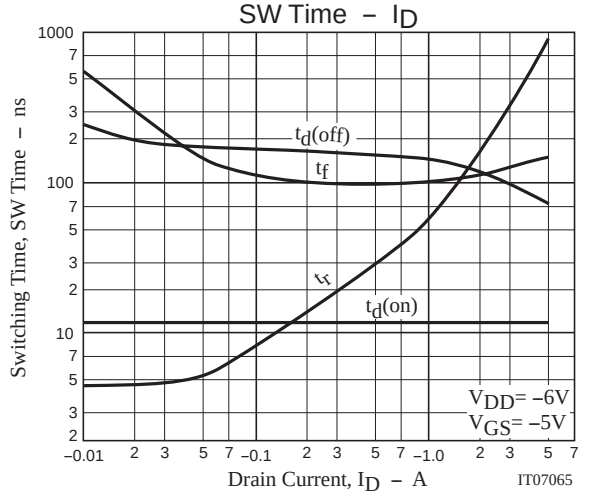

ID – VGS
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT07060
VDS= –6V
25°C
Ta=75°C
–25°C

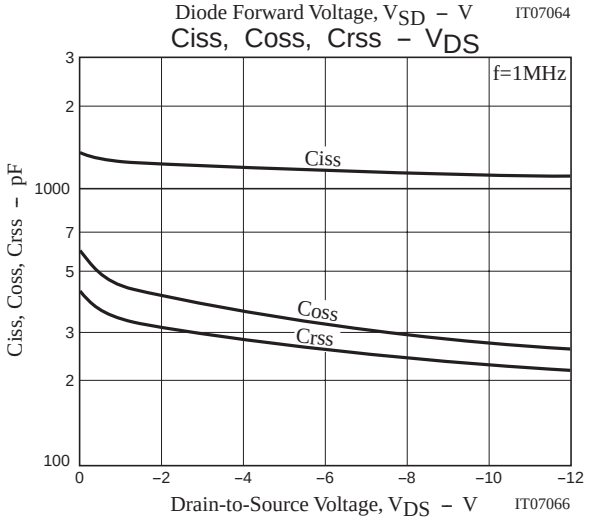

RDS(on) – VGS
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT07061
Ta=25°C
–1A
–2A
ID= –500mA


RDS(on) – Ta
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT07062
ID= –0.5A, VGS= –2.5V
ID= –1A, VGS= –4.5V
ID= –2A, VGS= –5V


|yfs| – ID
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT07063
VDS= –6V
Ta= –25°C
75°C
25°C


IF – VSD
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT07064
VGS=0
Ta=75°C
25°C
–25°C


SW Time – ID
Switching Time, SW Time – ns
Drain Current, ID – A
IT07065
td(off)
tf
tr
td(on)
VDD= –6V
VGS= –5V


Ciss, Coss, Crss – VDS
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT07066
f=1MHz
Ciss
Coss
Crss