



SANYO Semiconductors

## DATA SHEET

# ECH8601M — N-Channel Silicon MOSFET

## General-Purpose Switching Device Applications

### Features

- Low ON-resistance.
- Built-in gate protection resistor.
- 2.5V drive.
- Best suited for LiB charging and discharging switch.
- Common-drain type.
- Halogen free compliance.

### Specifications

#### Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V <sub>DSS</sub>		24	V
Gate-to-Source Voltage	V <sub>GSS</sub>		±12	V
Drain Current (DC)	I <sub>D</sub>		8	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	60	A
Allowable Power Dissipation	P <sub>D</sub>	When mounted on ceramic substrate (1000mm <sup>2</sup> ×0.8mm) 1unit	1.5	W
Total Dissipation	P <sub>T</sub>	When mounted on ceramic substrate (1000mm <sup>2</sup> ×0.8mm)	1.6	W
Channel Temperature	T <sub>ch</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

#### Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> =1mA, V <sub>GS</sub> =0V	24			V
Zero-Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V			1	μA
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V			±10	μA
Cutoff Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA	0.5		1.3	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =4A	3.1	5.3		S

Marking : TL

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**SANYO Semiconductor Co., Ltd.**

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# ECH8601M

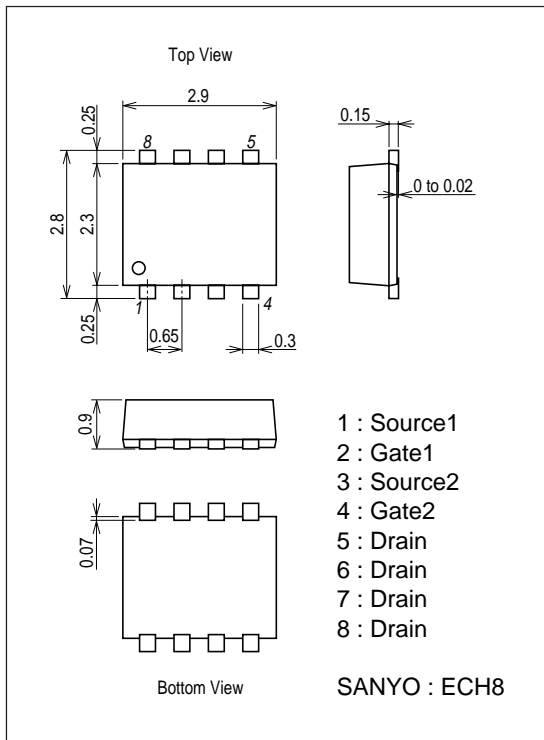
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Static Drain-to-Source On-State Resistance	R <sub>DS(on)1</sub>	I <sub>D</sub> =4A, V <sub>GS</sub> =4.5V	13.5	17	23	mΩ
	R <sub>DS(on)2</sub>	I <sub>D</sub> =4A, V <sub>GS</sub> =4.0V	14	18	24	mΩ
	R <sub>DS(on)3</sub>	I <sub>D</sub> =4A, V <sub>GS</sub> =3.1V	14.5	20	30	mΩ
	R <sub>DS(on)4</sub>	I <sub>D</sub> =2A, V <sub>GS</sub> =2.5V	16	24	35	mΩ
Turn-ON Delay Time	t <sub>d(on)</sub>	See specified Test Circuit.		300		ns
Rise Time	t <sub>r</sub>	See specified Test Circuit.		1000		ns
Turn-OFF Delay Time	t <sub>d(off)</sub>	See specified Test Circuit.		3000		ns
Fall Time	t <sub>f</sub>	See specified Test Circuit.		1800		ns
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =8A		7.5		nC
Gate-to-Source Charge	Q <sub>gs</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =8A		1.5		nC
Gate-to-Drain "Miller" Charge	Q <sub>gd</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =8A		2.0		nC
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =8A, V <sub>GS</sub> =0V		0.8	1.2	V

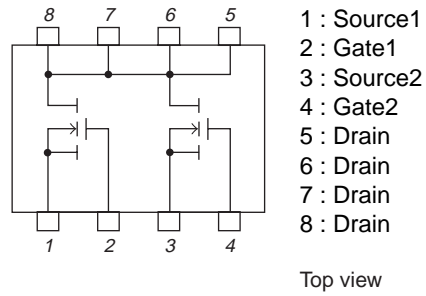
## Package Dimensions

unit : mm (typ)

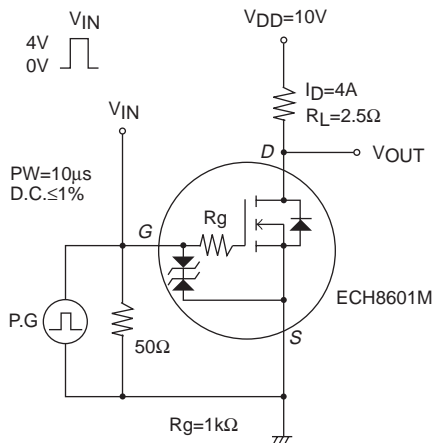
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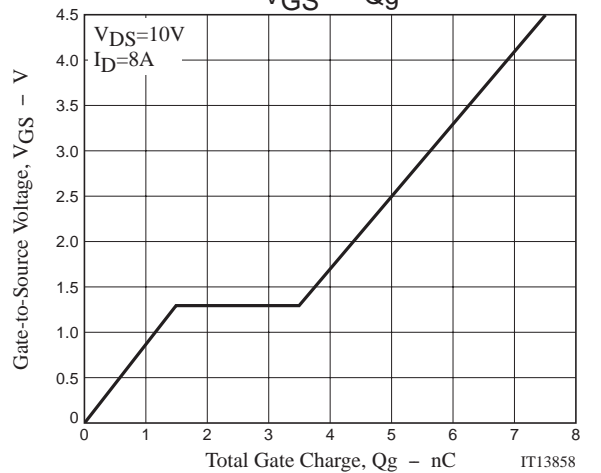
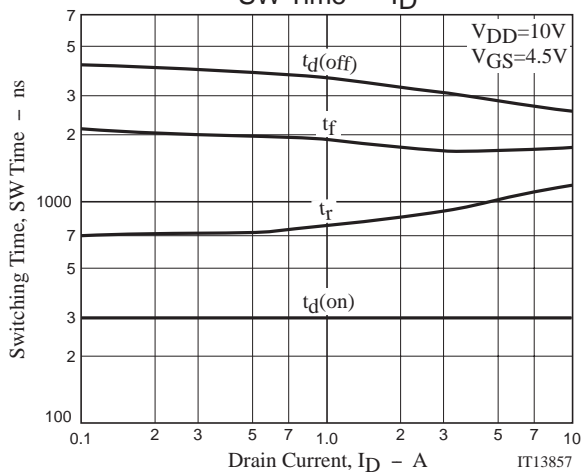
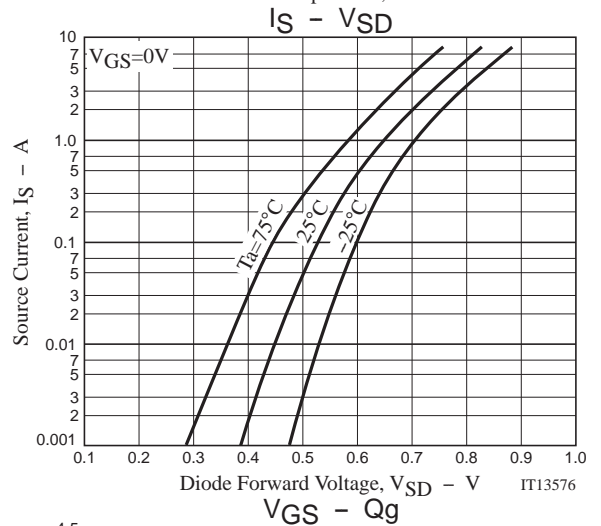
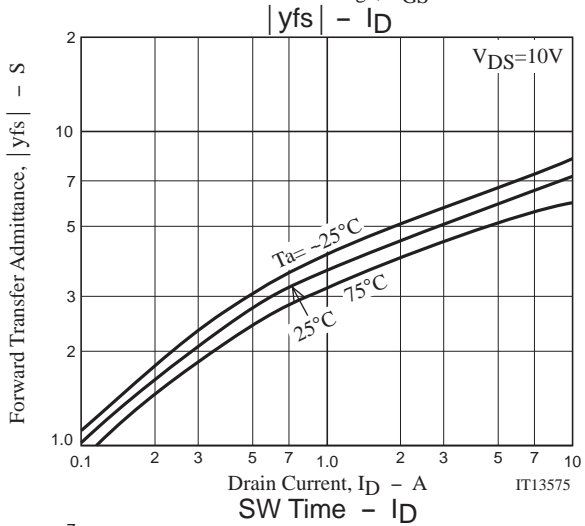
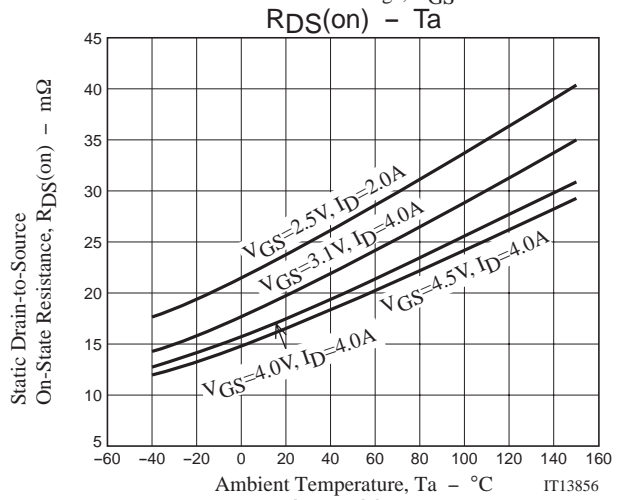
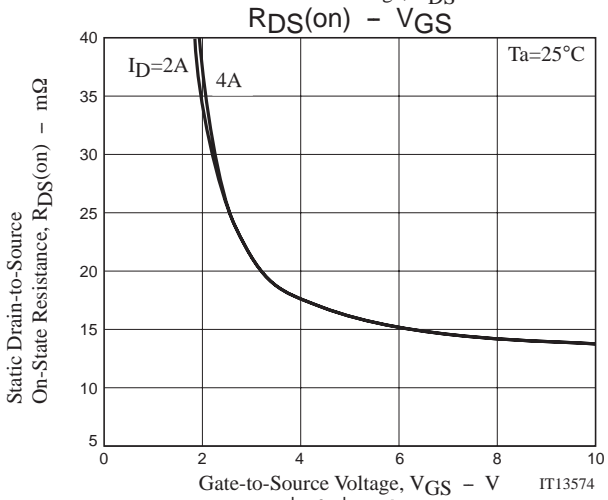
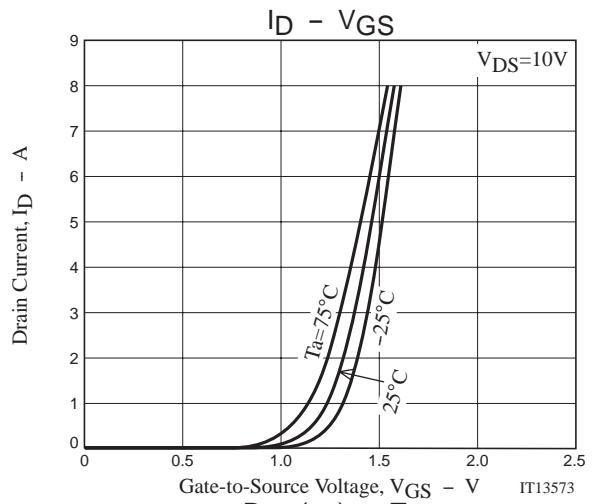
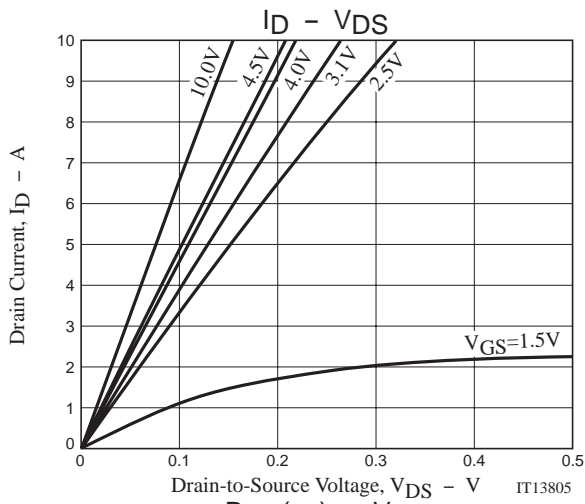
## Electrical Connection



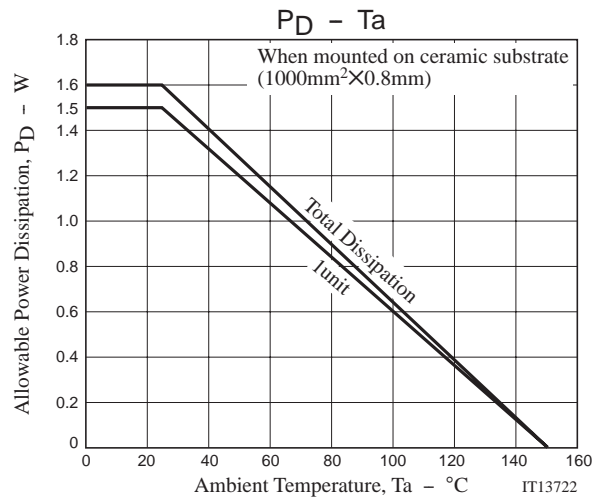
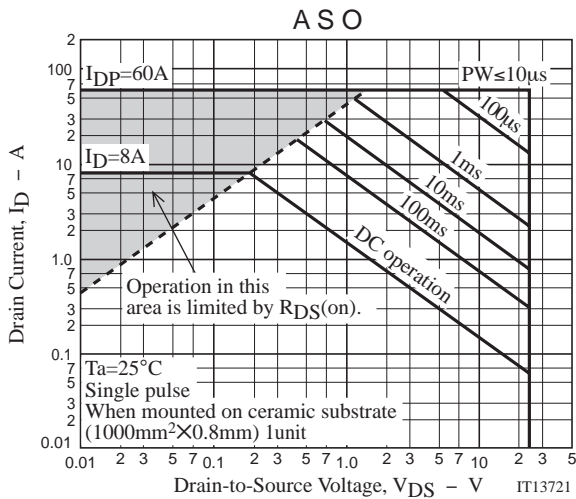
## Switching Time Test Circuit



# ECH8601M



# ECH8601M



Note on usage : Since the ECH8601M is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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