



SANYO Semiconductors

## DATA SHEET

N-Channel Silicon MOSFET

# ECH8659 — General-Purpose Switching Device Applications

## Features

- 4V drive.
- Composite type, facilitating high-density mounting.
- Halogen free compliance.

## Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V <sub>DSS</sub>		30	V
Gate-to-Source Voltage	V <sub>GS</sub>		±20	V
Drain Current (DC)	I <sub>D</sub>		7	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	40	A
Allowable Power Dissipation	P <sub>D</sub>	When mounted on ceramic substrate (900mm <sup>2</sup> ×0.8mm) 1unit	1.3	W
Total Dissipation	P <sub>T</sub>	When mounted on ceramic substrate (900mm <sup>2</sup> ×0.8mm)	1.5	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	30			V
Zero-Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V			1	μA
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±16V, V <sub>DS</sub> =0V			±10	μA
Cutoff Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA	1.2		2.6	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =3.5A	2.2	3.7		S

Marking : TE

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SANYO Semiconductor Co., Ltd.

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# ECH8659

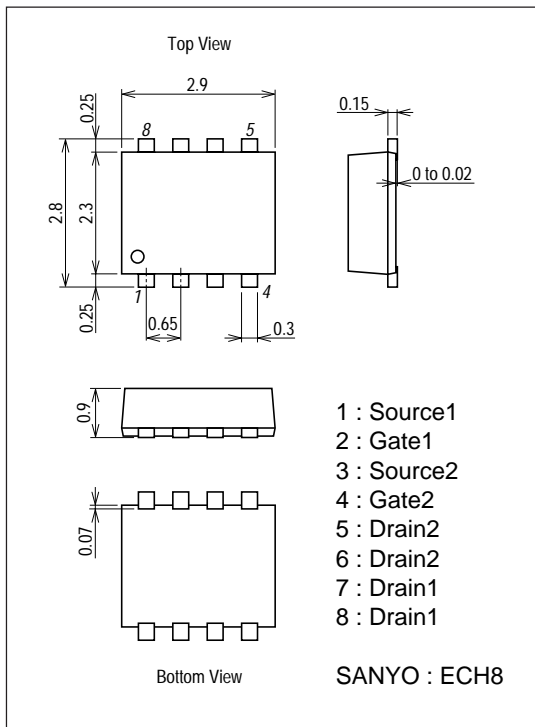
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=3.5A, V_{GS}=10V$		18	24	$m\Omega$
	$R_{DS(on)2}$	$I_D=2A, V_{GS}=4.5V$		29	41	$m\Omega$
	$R_{DS(on)3}$	$I_D=2A, V_{GS}=4V$		39	55	$m\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=10V, f=1MHz$		710		$pF$
Output Capacitance	$C_{oss}$	$V_{DS}=10V, f=1MHz$		120		$pF$
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS}=10V, f=1MHz$		72		$pF$
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		10		ns
Rise Time	$t_r$	See specified Test Circuit.		25		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit.		43		ns
Fall Time	$t_f$	See specified Test Circuit.		25		ns
Total Gate Charge	$Q_g$	$V_{DS}=15V, V_{GS}=10V, I_D=3.5A$		11.8		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=15V, V_{GS}=10V, I_D=3.5A$		2.4		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$	$V_{DS}=15V, V_{GS}=10V, I_D=3.5A$		2.0		nC
Diode Forward Voltage	$V_{SD}$	$I_S=7A, V_{GS}=0V$		0.79	1.2	V

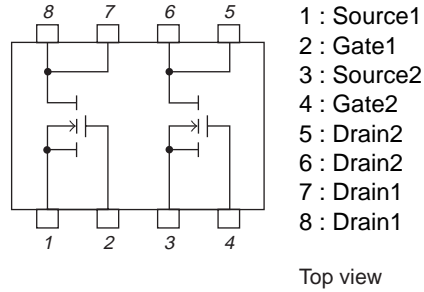
## Package Dimensions

unit : mm (typ)

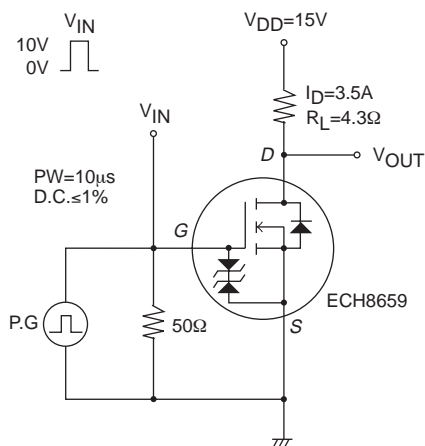
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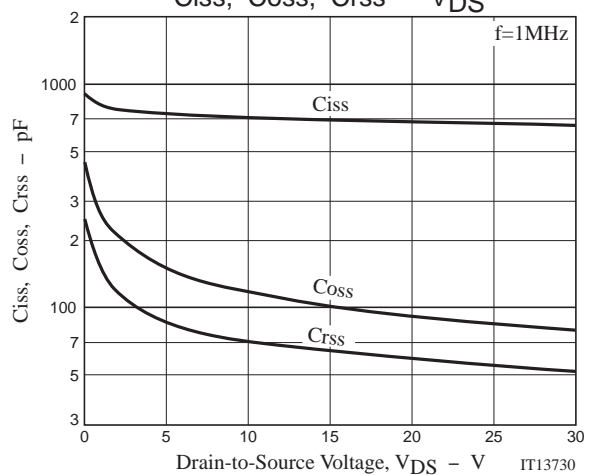
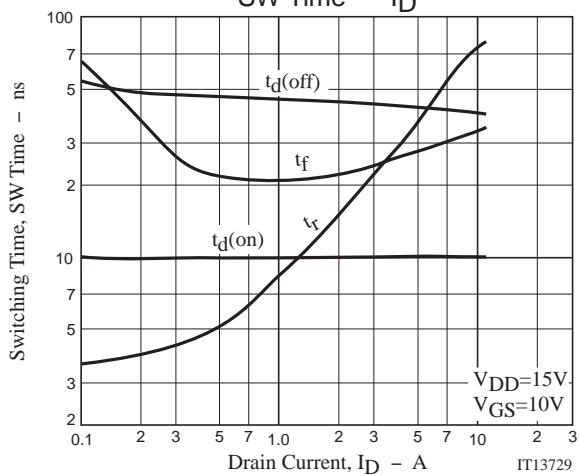
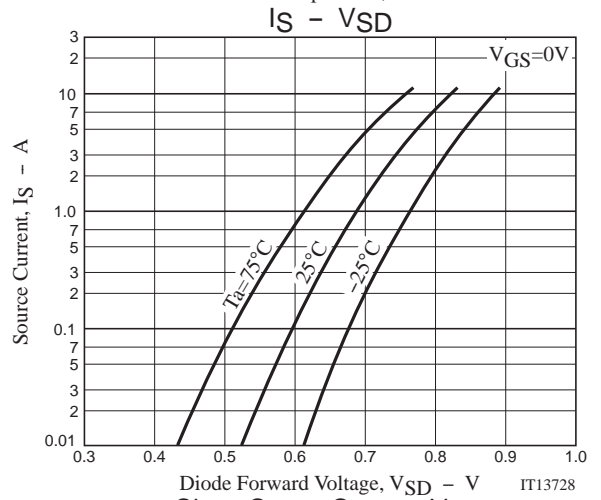
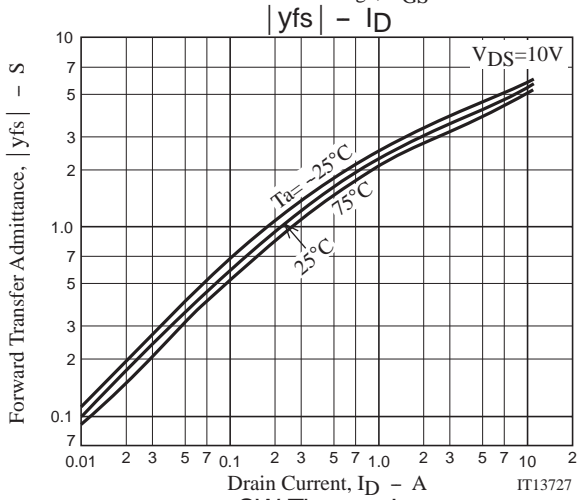
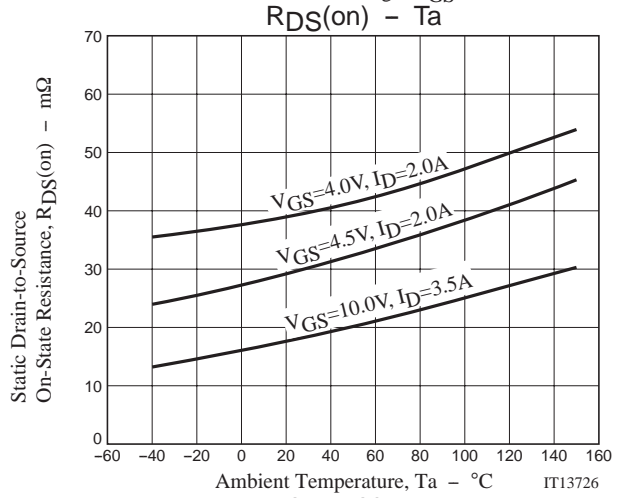
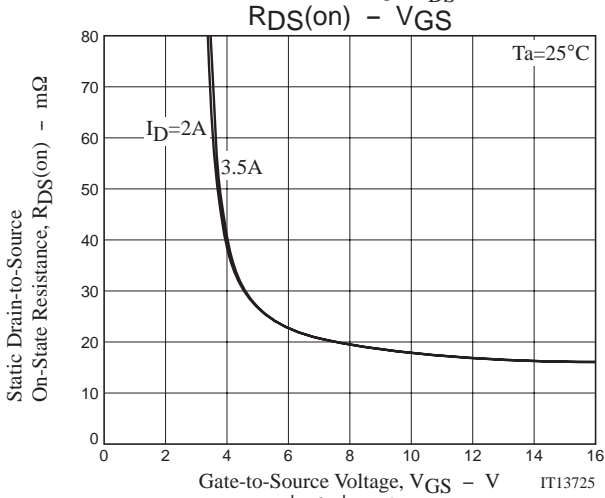
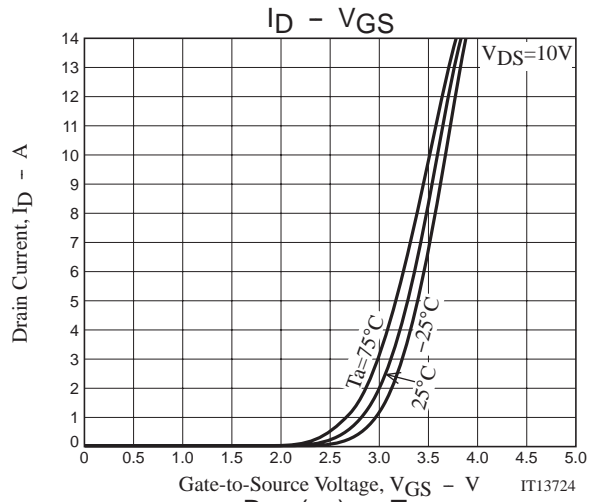
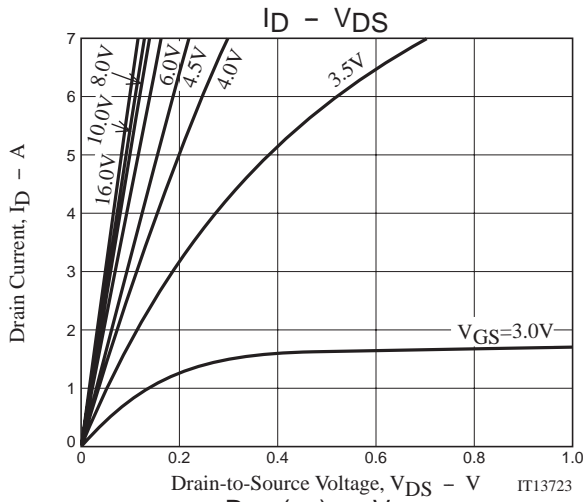


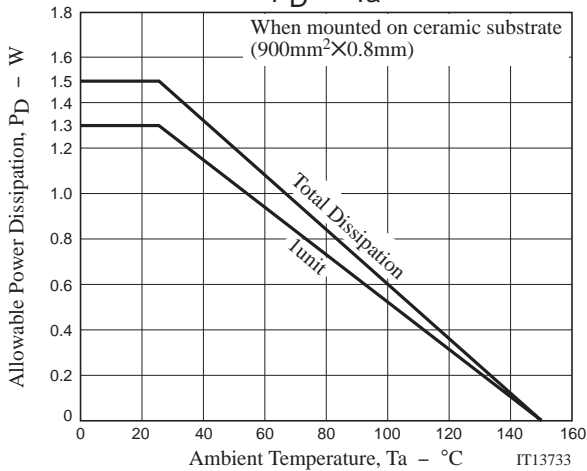
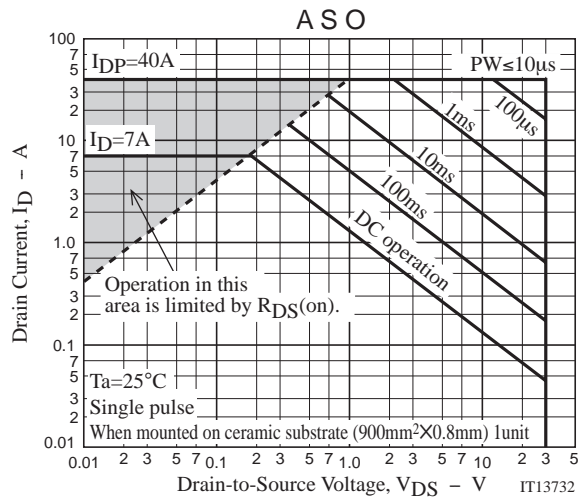
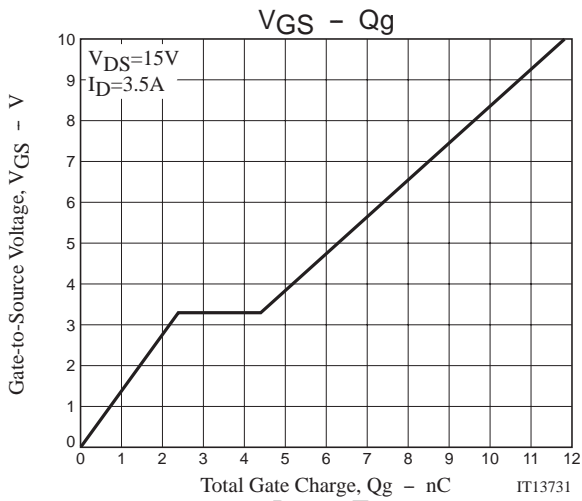
## Electrical Connection



## Switching Time Test Circuit







Note on usage : Since the ECH8659 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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