



# ECH8653 — N-Channel Silicon MOSFET

## General-Purpose Switching Device Applications

### Features

- Low ON-resistance.
- 4V 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>		20	V
Gate-to-Source Voltage	V <sub>GSS</sub>		±10	V
Drain Current (DC)	I <sub>D</sub>		7.5	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	40	A
Allowable Power Dissipation	P <sub>D</sub>	Mounted on a ceramic board (900mm <sup>2</sup> ×0.8mm) 1unit	1.4	W
Total Dissipation	P <sub>T</sub>	Mounted on a ceramic board (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	20			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	1.0		2.4	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =4A	3.4	5.8		S

Marking : WY

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# ECH8653

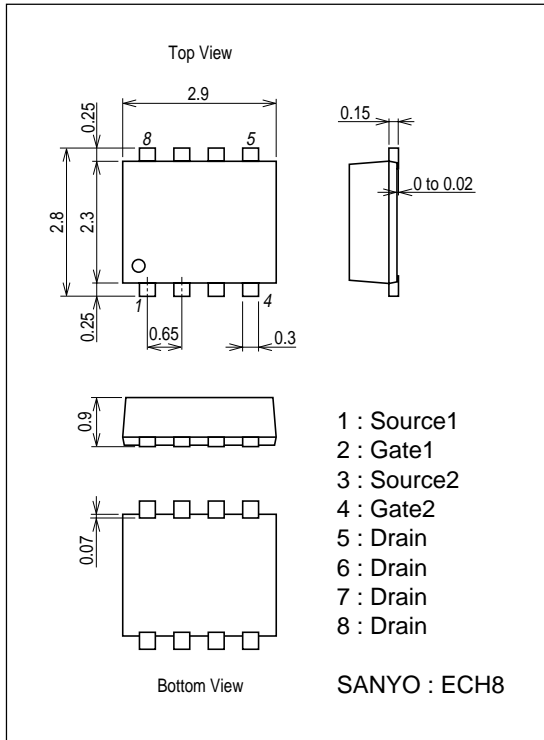
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=4A, V_{GS}=8V$	9	14	20	m $\Omega$
	$R_{DS(on)2}$	$I_D=4A, V_{GS}=4V$	11	18	25	m $\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=10V, f=1MHz$		1280		pF
Output Capacitance	$C_{oss}$	$V_{DS}=10V, f=1MHz$		170		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS}=10V, f=1MHz$		105		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		13		ns
Rise Time	$t_r$	See specified Test Circuit.		48		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit.		94		ns
Fall Time	$t_f$	See specified Test Circuit.		36		ns
Total Gate Charge	$Q_g$	$V_{DS}=10V, V_{GS}=8V, I_D=7.5A$		18.5		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=10V, V_{GS}=8V, I_D=7.5A$		2.7		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$	$V_{DS}=10V, V_{GS}=8V, I_D=7.5A$		3.1		nC
Diode Forward Voltage	$V_{SD}$	$I_S=7.5A, V_{GS}=0V$		0.82	1.2	V

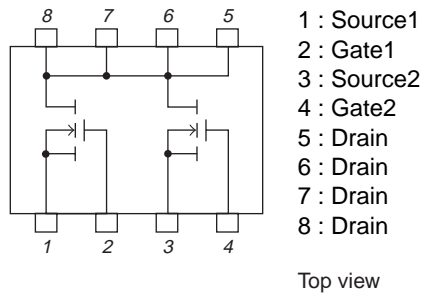
## Package Dimensions

unit : mm (typ)

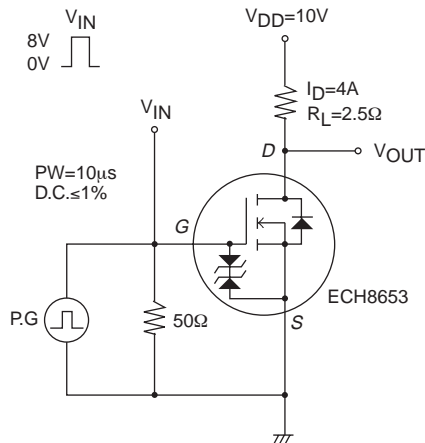
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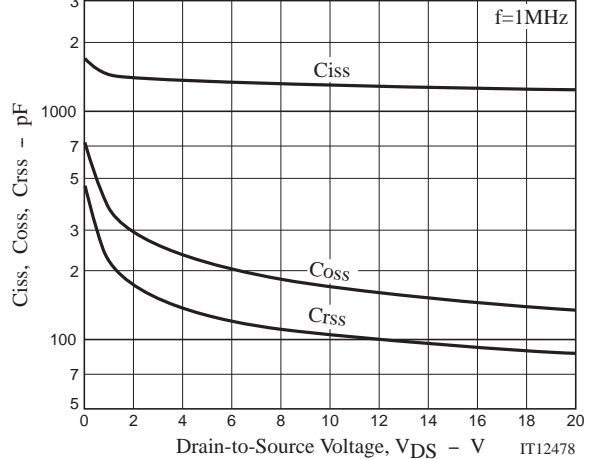
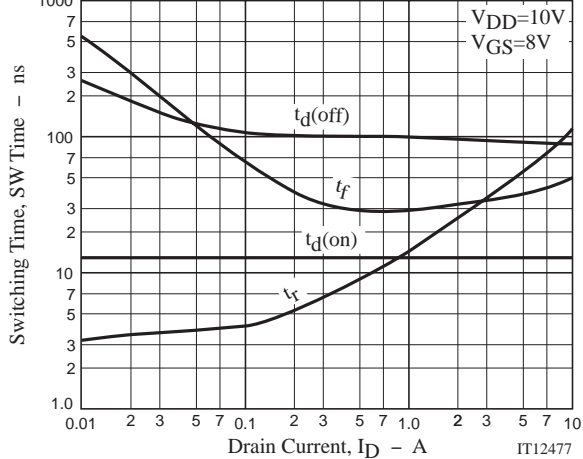
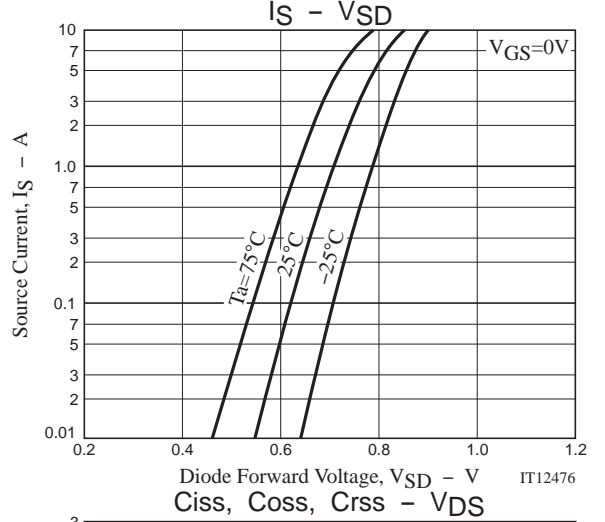
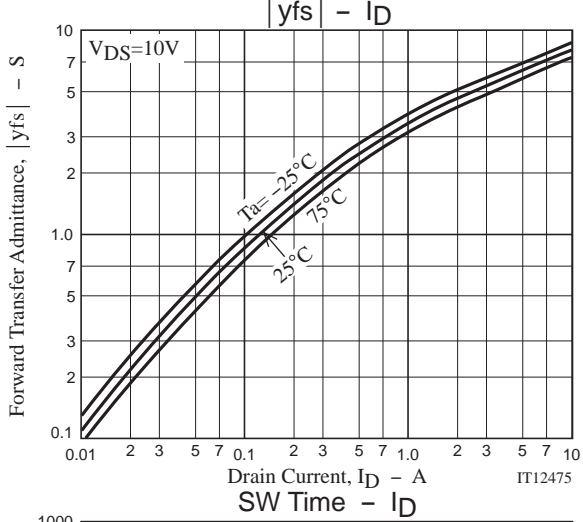
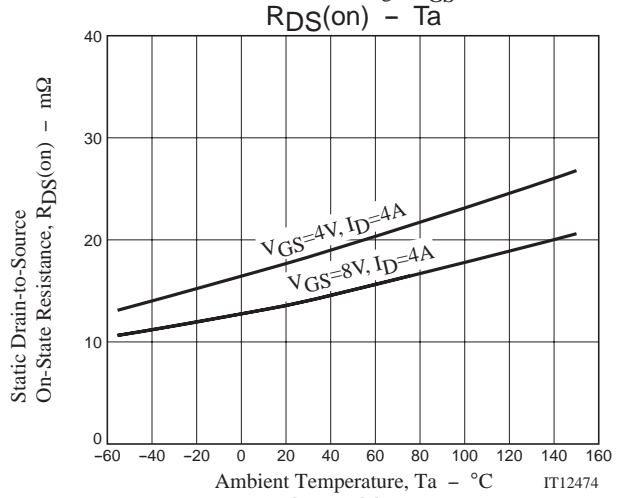
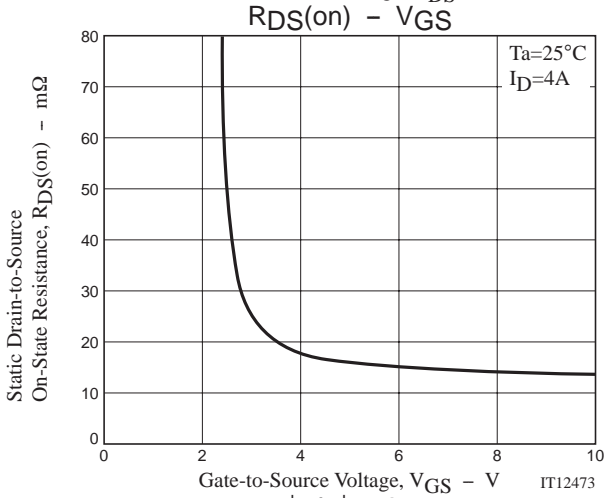
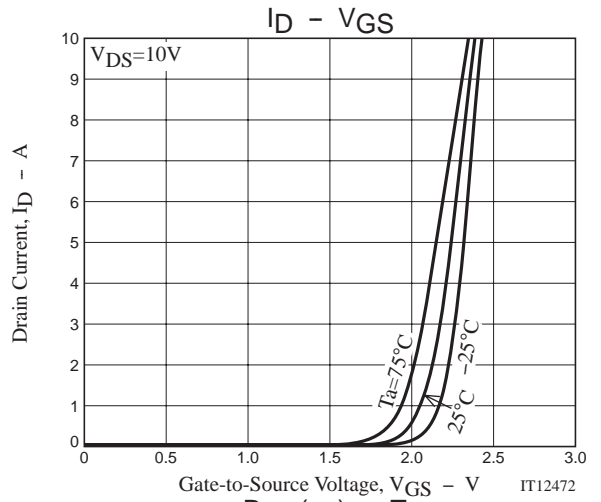
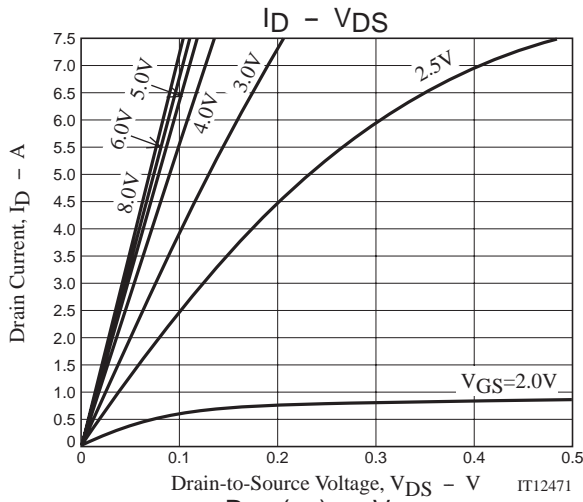


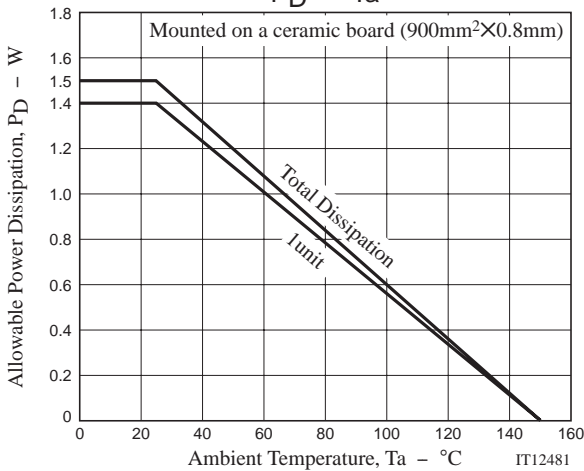
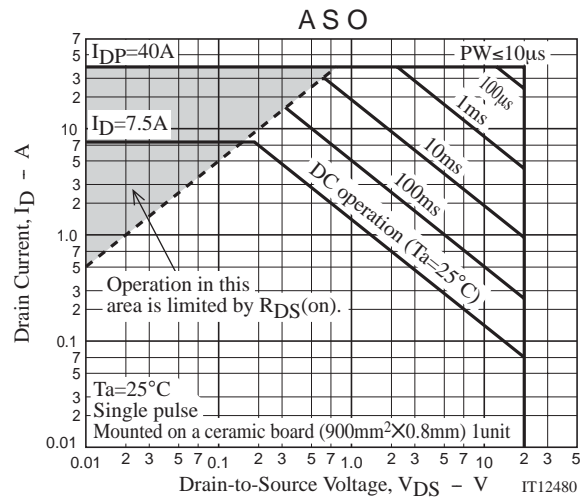
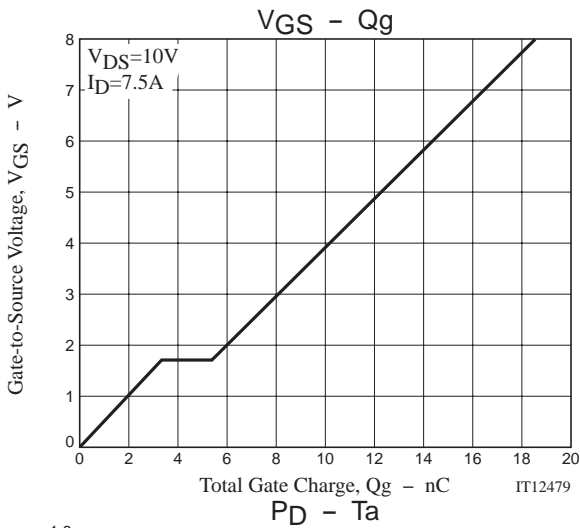
## Electrical Connection



## Switching Time Test Circuit







Note on usage : Since the ECH8653 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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