



# ECH8320 — P-Channel Silicon MOSFET

## General-Purpose Switching Device Applications

### Features

- Low ON-resistance.
- 1.8V drive.
- Halogen free compliance.

### Specifications

Absolute Maximum Ratings at  $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	$V_{DS}$		-20	V
Gate-to-Source Voltage	$V_{GS}$		$\pm 10$	V
Drain Current (DC)	$I_D$		-9.5	A
Drain Current (Pulse)	$I_{DP}$	$PW \leq 10\mu\text{s}$ , duty cycle $\leq 1\%$	-40	A
Allowable Power Dissipation	$P_D$	When mounted on ceramic substrate (900mm <sup>2</sup> ×0.8mm)	1.6	W
Channel Temperature	$T_{ch}$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

Electrical Characteristics at  $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = -1\text{mA}$ , $V_{GS} = 0\text{V}$	-20			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -20\text{V}$ , $V_{GS} = 0\text{V}$			-1	$\mu\text{A}$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 8\text{V}$ , $V_{DS} = 0\text{V}$			$\pm 10$	$\mu\text{A}$
Cutoff Voltage	$V_{GS(off)}$	$V_{DS} = -10\text{V}$ , $I_D = -1\text{mA}$	-0.4		-1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS} = -10\text{V}$ , $I_D = -5\text{A}$		16		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D = -5\text{A}$ , $V_{GS} = -4.5\text{V}$		11	14.5	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D = -3\text{A}$ , $V_{GS} = -2.5\text{V}$		16	23	$\text{m}\Omega$
	$R_{DS(on)3}$	$I_D = -1\text{A}$ , $V_{GS} = -1.8\text{V}$		25	39	$\text{m}\Omega$

Marking : YA

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# ECH8320

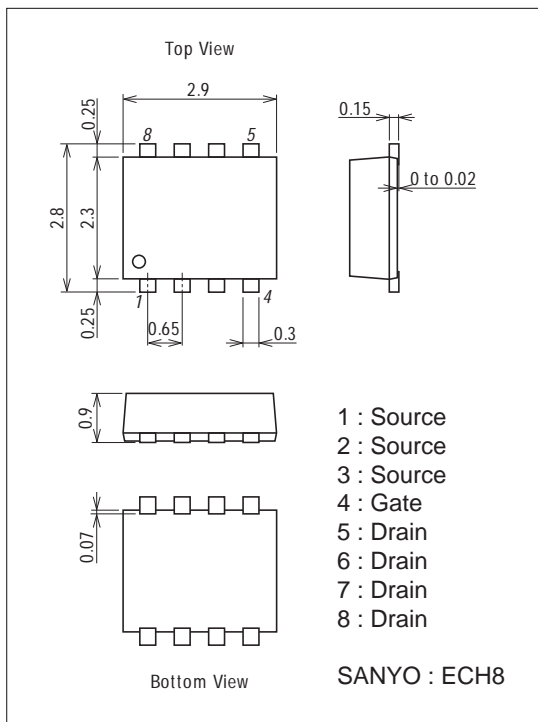
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	$V_{DS} = -10V, f = 1MHz$		2300		pF
Output Capacitance	Coss	$V_{DS} = -10V, f = 1MHz$		440		pF
Reverse Transfer Capacitance	Crss	$V_{DS} = -10V, f = 1MHz$		340		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		24		ns
Rise Time	$t_r$	See specified Test Circuit.		100		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		230		ns
Fall Time	$t_f$	See specified Test Circuit.		163		ns
Total Gate Charge	Qg	$V_{DS} = -10V, V_{GS} = -4.5V, I_D = -9.5A$		25		nC
Gate-to-Source Charge	Qgs	$V_{DS} = -10V, V_{GS} = -4.5V, I_D = -9.5A$		3.6		nC
Gate-to-Drain "Miller" Charge	Qgd	$V_{DS} = -10V, V_{GS} = -4.5V, I_D = -9.5A$		7.6		nC
Diode Forward Voltage	VSD	$I_S = -9.5A, V_{GS} = 0V$		-0.79	-1.2	V

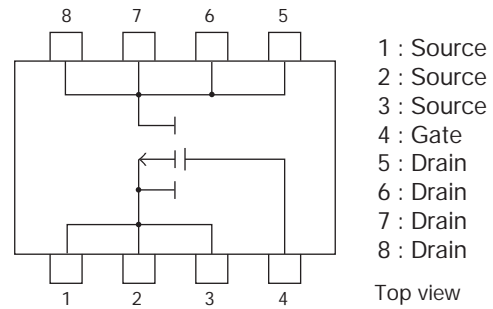
## Package Dimensions

unit : mm (typ)

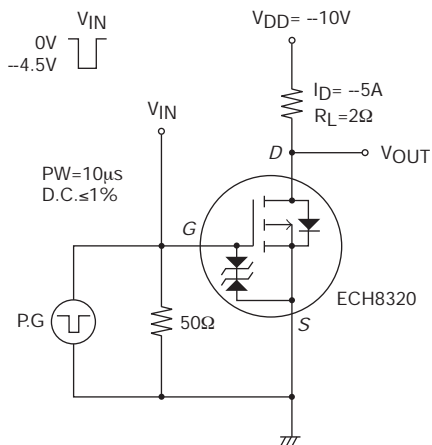
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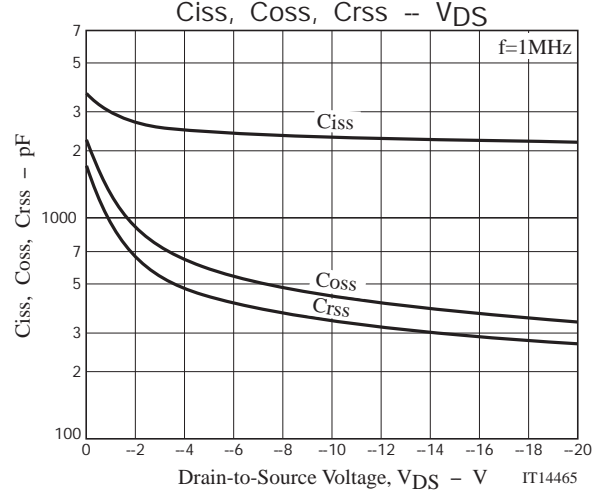
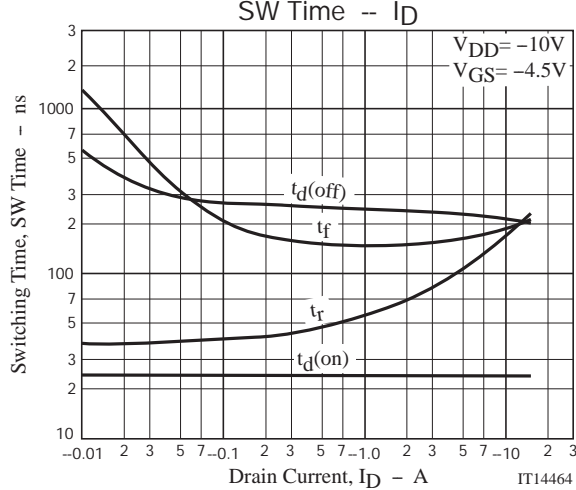
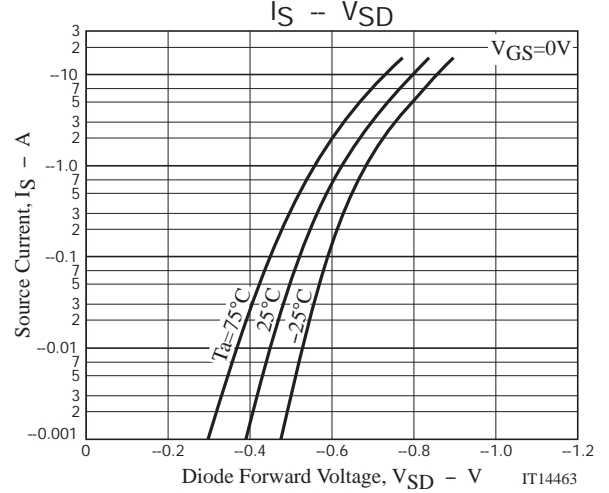
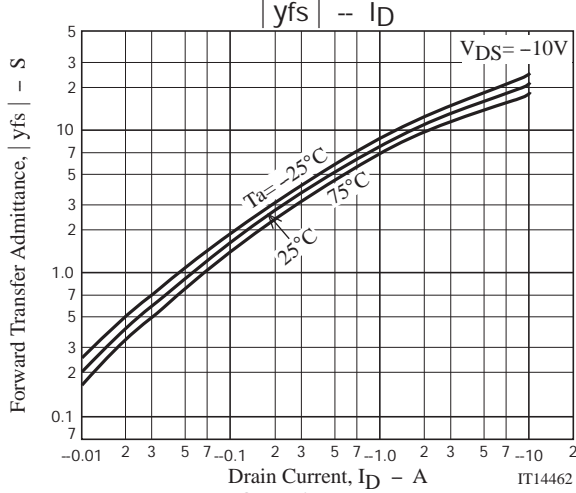
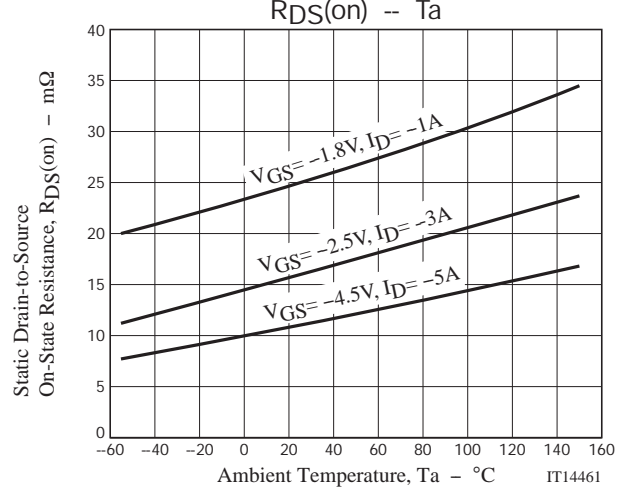
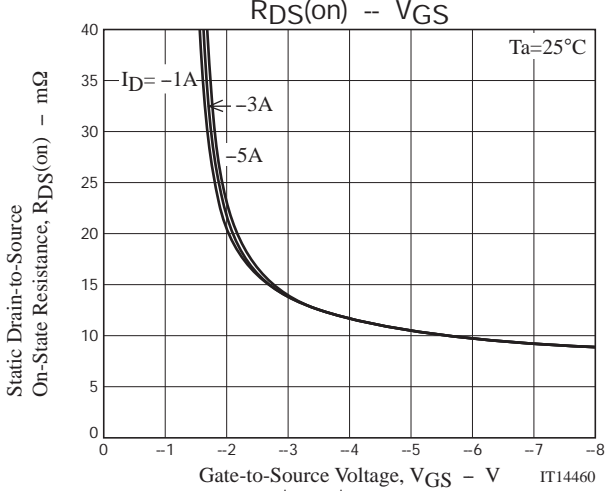
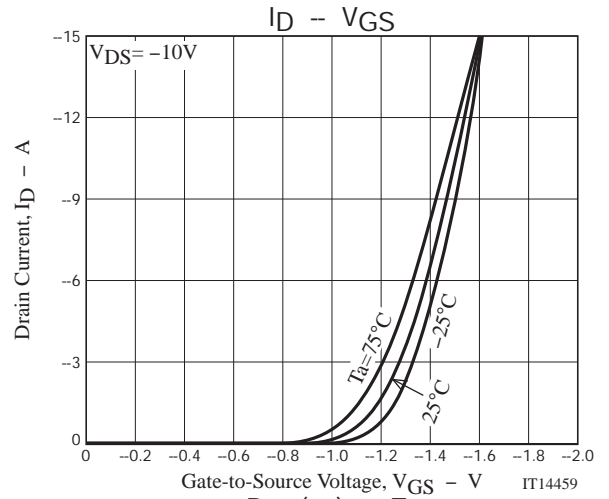
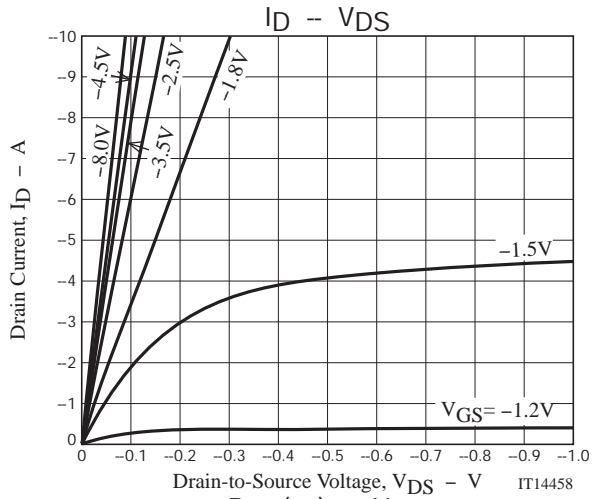


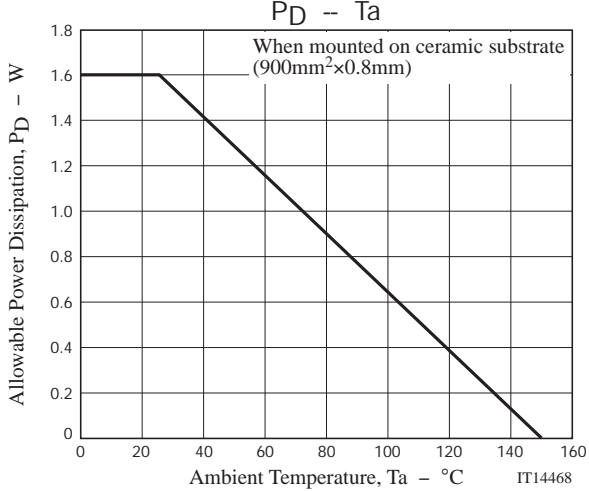
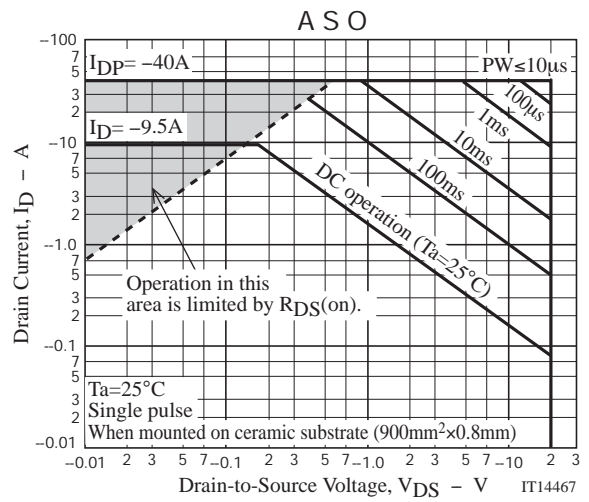
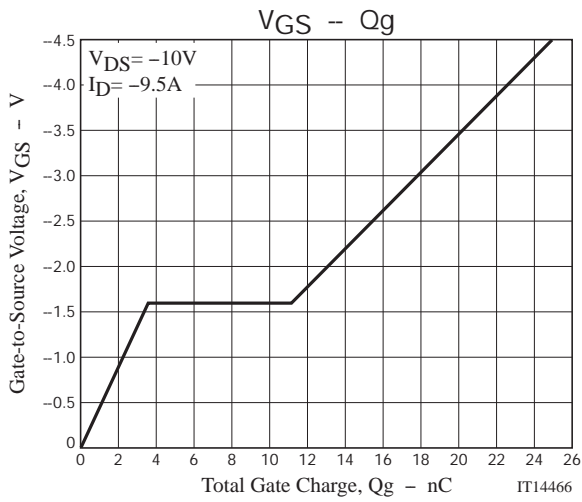
## Electrical Connection



## Switching Time Test Circuit







Note on usage : Since the ECH8320 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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