



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

N-Channel Silicon MOSFET

ECH8656 — General-Purpose Switching Device Applications

Features

- ON-resistance $R_{DS(on)1}=13m\Omega$ (typ.)
- Halogen free compliance
- Protection diode in
- 1.8V drive
- Nch + Nch MOSFET

Specifications

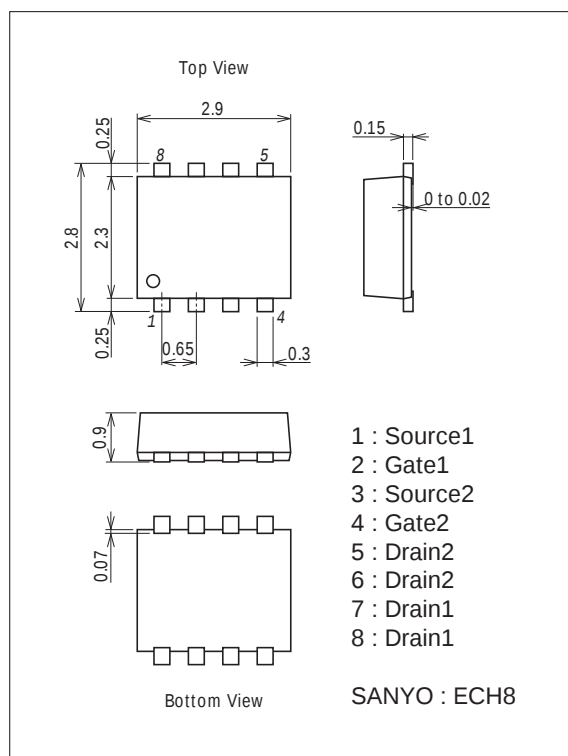
Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DS}		20	V
Gate-to-Source Voltage	V_{GS}		± 10	V
Drain Current (DC)	I_D		7.5	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu s$, duty cycle $\leq 1\%$	40	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (900mm ² ×0.8mm) 1unit	1.3	W
Total Dissipation	P_T	When mounted on ceramic substrate (900mm ² ×0.8mm)	1.5	W
Channel Temperature	T_{ch}		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

Package Dimensions

unit : mm (typ)

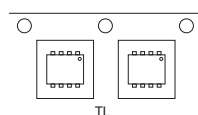
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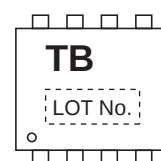
Product & Package Information

- Package : ECH8
- JEITA, JEDEC : -
- Minimum Packing Quantity : 3,000 pcs./reel

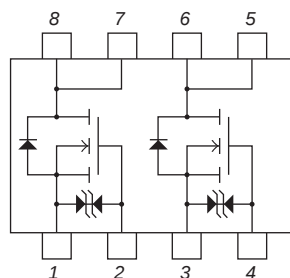
Packing Type : TL



Marking



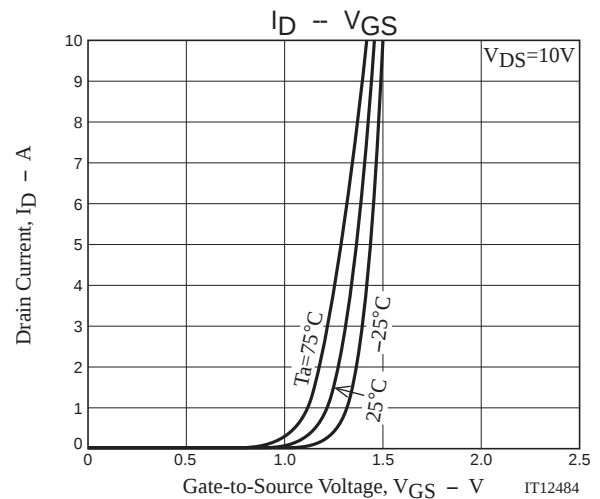
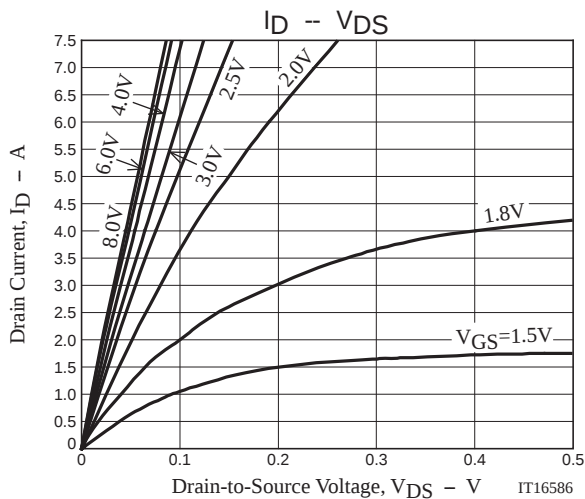
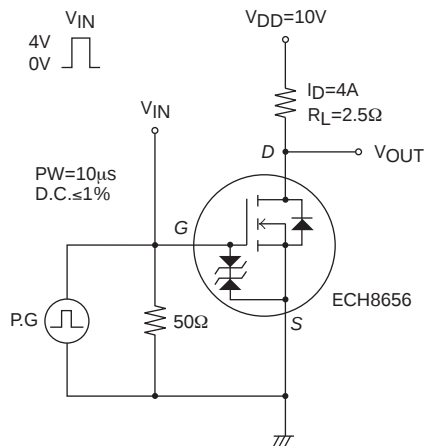
Electrical Connection

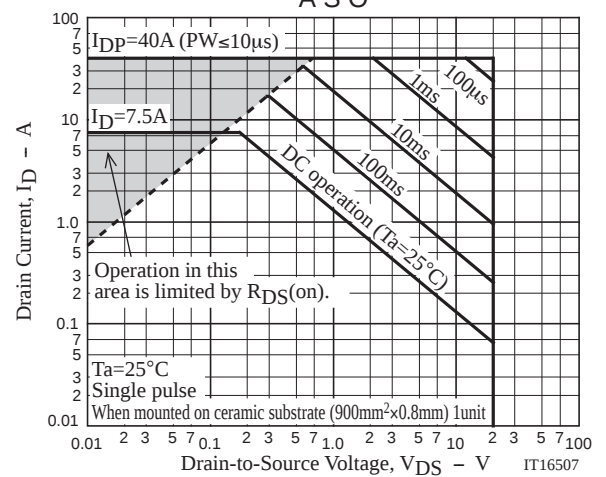
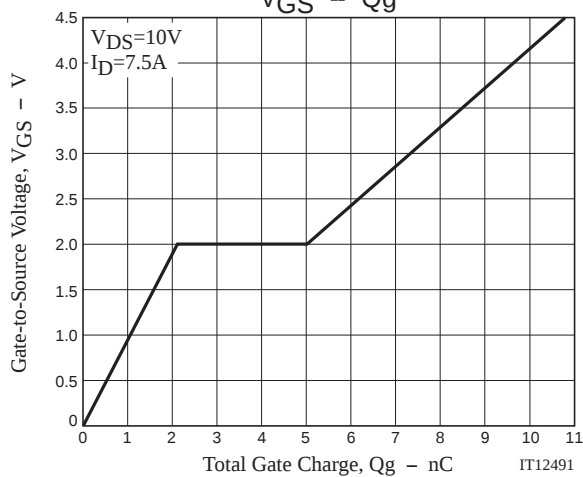
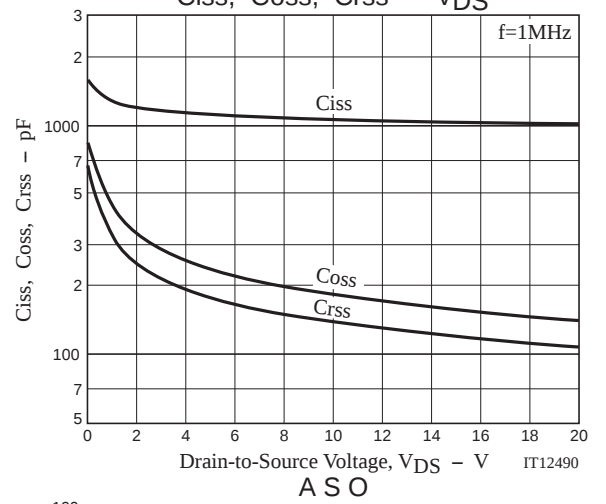
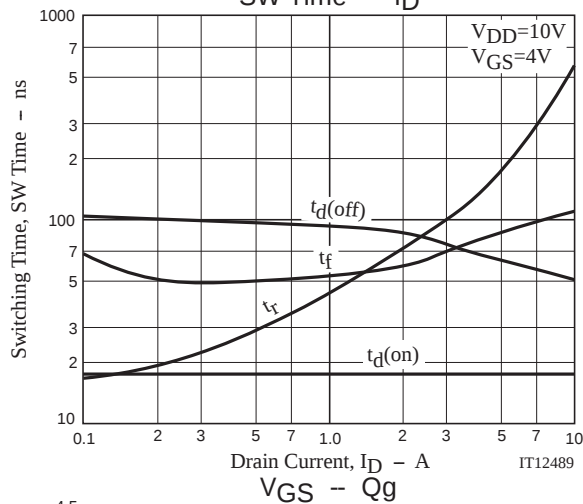
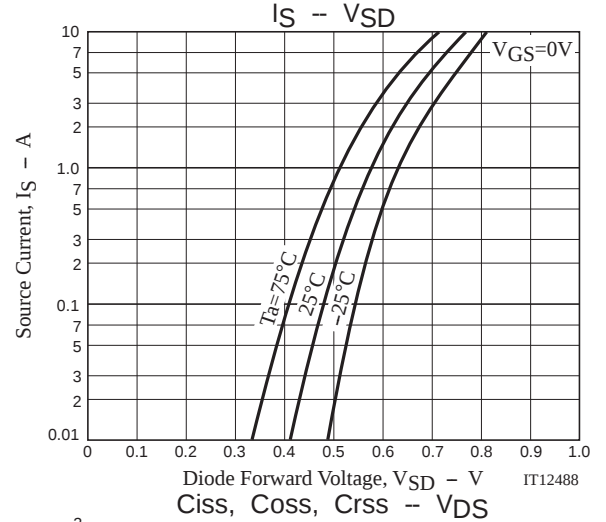
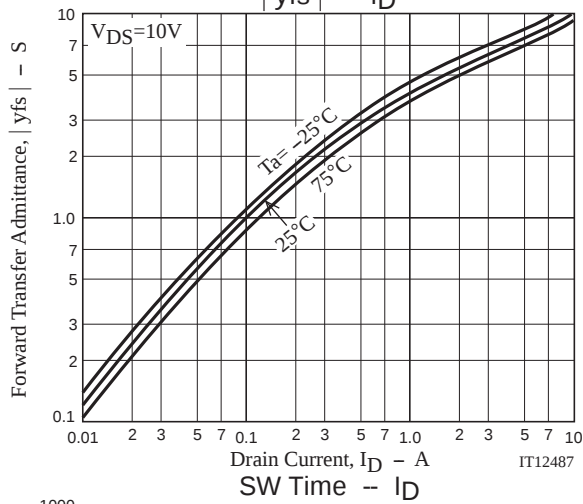
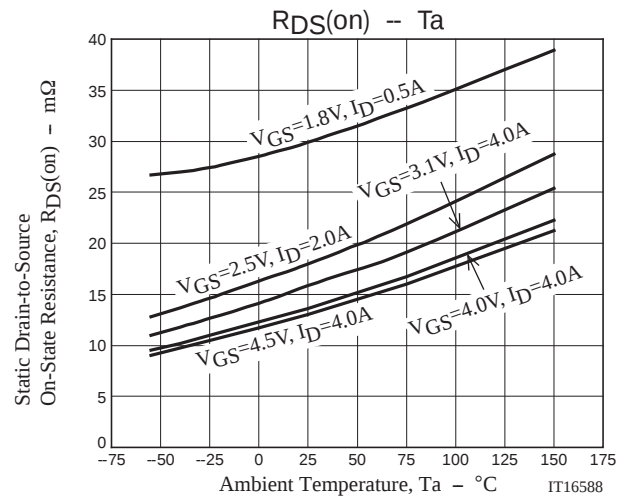
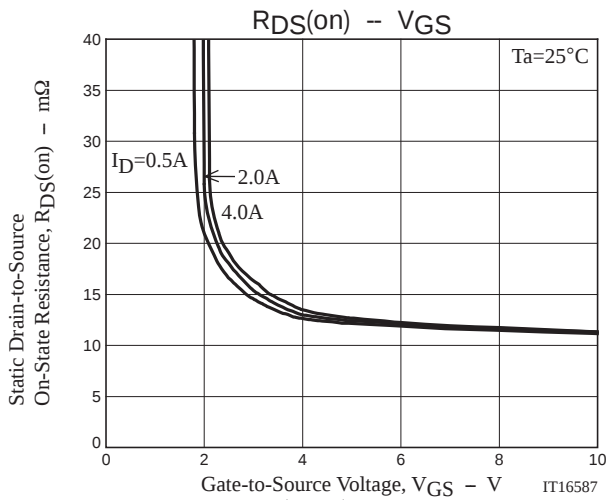


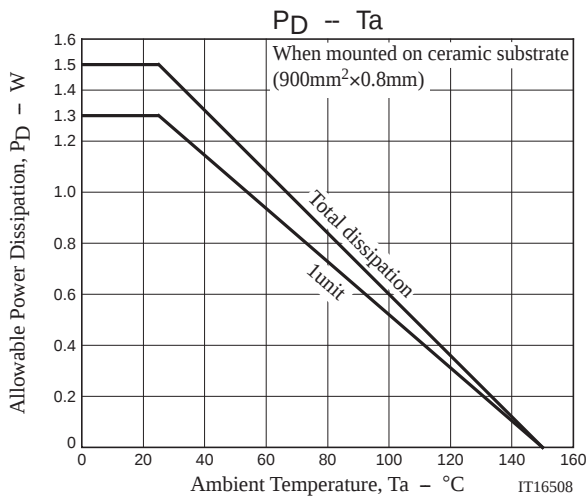
Electrical Characteristics at $T_a=25^\circ\text{C}$

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	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8\text{V}$, $V_{DS}=0\text{V}$			± 10	μA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10\text{V}$, $I_D=1\text{mA}$	0.5		1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10\text{V}$, $I_D=4\text{A}$		7		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=4\text{A}$, $V_{GS}=4.5\text{V}$	9	13	17	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=4\text{A}$, $V_{GS}=4.0\text{V}$	9.4	13.5	18	$\text{m}\Omega$
	$R_{DS(on)3}$	$I_D=4\text{A}$, $V_{GS}=3.1\text{V}$	11	16	22	$\text{m}\Omega$
	$R_{DS(on)4}$	$I_D=2\text{A}$, $V_{GS}=2.5\text{V}$	12.5	18	26	$\text{m}\Omega$
	$R_{DS(on)5}$	$I_D=0.5\text{A}$, $V_{GS}=1.8\text{V}$	17	30	48	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{DS}=10\text{V}$, $f=1\text{MHz}$		1060		pF
Output Capacitance	C_{oss}	$V_{DS}=10\text{V}$, $f=1\text{MHz}$		180		pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=10\text{V}$, $f=1\text{MHz}$		135		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		17.5		ns
Rise Time	t_r	See specified Test Circuit.		120		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		68		ns
Fall Time	t_f	See specified Test Circuit.		80		ns
Total Gate Charge	Q_g	$V_{DS}=10\text{V}$, $V_{GS}=4.5\text{V}$, $I_D=7.5\text{A}$		10.8		nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=10\text{V}$, $V_{GS}=4.5\text{V}$, $I_D=7.5\text{A}$		2.1		nC
Gate-to-Drain "Miller" Charge	Q_{gd}	$V_{DS}=10\text{V}$, $V_{GS}=4.5\text{V}$, $I_D=7.5\text{A}$		2.9		nC
Diode Forward Voltage	V_{SD}	$I_S=7.5\text{A}$, $V_{GS}=0\text{V}$		0.74	1.2	V

Switching Time Test Circuit







Note on usage : Since the ECH8656 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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