



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

N-Channel and P-Channel Silicon MOSFETs

ECH8660 — General-Purpose Switching Device Applications

Features

- The ECH8660 incorporates an N-channel MOSFET and a P-channel MOSFET that feature low ON-resistance and high-speed switching , thereby enabling high-density mounting
- 4V drive
- Halogen free compliance

Specifications

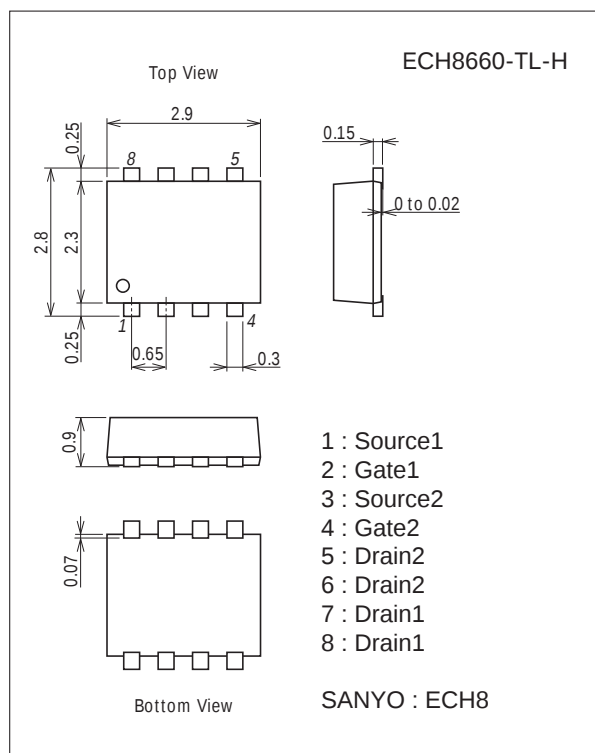
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	N-channel	P-channel	Unit
Drain-to-Source Voltage	V_{DS}		30	-30	V
Gate-to-Source Voltage	V_{GS}		±20	±20	V
Drain Current (DC)	I_D		4.5	-4.5	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu s$, duty cycle $\leq 1\%$	30	-30	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (1200mm ² ×0.8mm) 1unit	1.3		W
Total Dissipation	P_T	When mounted on ceramic substrate (1200mm ² ×0.8mm)	1.5		W
Channel Temperature	T_{ch}		150		°C
Storage Temperature	T_{stg}		-55 to +150		°C

Package Dimensions

unit : mm (typ)

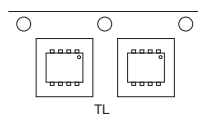
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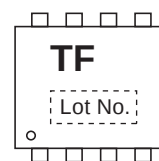
Product & Package Information

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

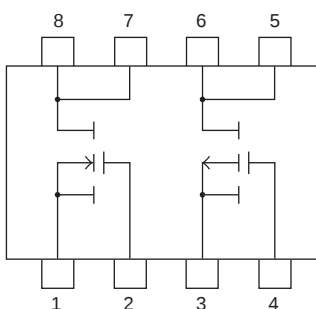
Packing Type : TL



Marking



Electrical Connection



SANYO Semiconductor Co., Ltd.

<http://semicon.sanyo.com/en/network>

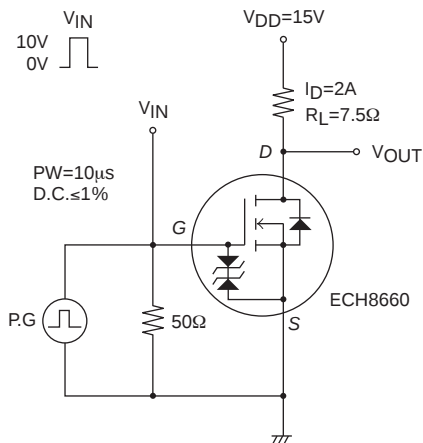
ECH8660

Electrical Characteristics at Ta=25°C

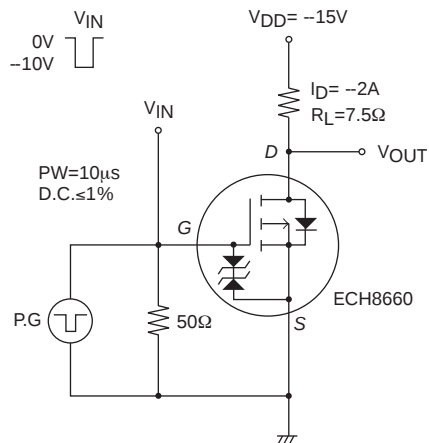
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[N-channel]						
Drain-to-Source Breakdown Voltage	V(BR)DSS	ID=1mA, VGS=0V	30			V
Zero-Gate Voltage Drain Current	IDSS	VDS=30V, VGS=0V			1	μA
Gate-to-Source Leakage Current	IGSS	VGS=±16V, VDS=0V			±10	μA
Cutoff Voltage	VGS(off)	VDS=10V, ID=1mA	1.2		2.6	V
Forward Transfer Admittance	yfs	VDS=10V, ID=2A	1	1.66		S
Static Drain-to-Source On-State Resistance	RDS(on)1	ID=2A, VGS=10V		45	59	mΩ
	RDS(on)2	ID=1A, VGS=4.5V		85	119	mΩ
	RDS(on)3	ID=1A, VGS=4V		110	155	mΩ
Input Capacitance	Ciss	VDS=10V, f=1MHz		240		pF
Output Capacitance	Coss	VDS=10V, f=1MHz		45		pF
Reverse Transfer Capacitance	Crss	VDS=10V, f=1MHz		30		pF
Turn-ON Delay Time	tD(on)	See specified Test Circuit.		6.2		ns
Rise Time	tr	See specified Test Circuit.		11		ns
Turn-OFF Delay Time	tD(off)	See specified Test Circuit.		17		ns
Fall Time	tf	See specified Test Circuit.		7.5		ns
Total Gate Charge	Qg	VDS=10V, VGS=10V, ID=4.5A		4.4		nC
Gate-to-Source Charge	Qgs	VDS=10V, VGS=10V, ID=4.5A		1.1		nC
Gate-to-Drain “Miller” Charge	Qgd	VDS=10V, VGS=10V, ID=4.5A		0.64		nC
Diode Forward Voltage	VSD	IS=4.5A, VGS=0V		0.84	1.2	V
[P-channel]						
Drain-to-Source Breakdown Voltage	V(BR)DSS	ID=−1mA, VGS=0V	−30			V
Zero-Gate Voltage Drain Current	IDSS	VDS=−30V, VGS=0V			−1	μA
Gate-to-Source Leakage Current	IGSS	VGS=±16V, VDS=0V			±10	μA
Cutoff Voltage	VGS(off)	VDS=−10V, ID=−1mA	−1.2		−2.3	V
Forward Transfer Admittance	yfs	VDS=−10V, ID=−2A	2.5	4.2		S
Static Drain-to-Source On-State Resistance	RDS(on)1	ID=−2A, VGS=−10V		45	59	mΩ
	RDS(on)2	ID=−1A, VGS=−4.5V		71	100	mΩ
	RDS(on)3	ID=−1A, VGS=−4V		82	115	mΩ
Input Capacitance	Ciss	VDS=−10V, f=1MHz		430		pF
Output Capacitance	Coss	VDS=−10V, f=1MHz		105		pF
Reverse Transfer Capacitance	Crss	VDS=−10V, f=1MHz		75		pF
Turn-ON Delay Time	tD(on)	See specified Test Circuit.		7.5		ns
Rise Time	tr	See specified Test Circuit.		26		ns
Turn-OFF Delay Time	tD(off)	See specified Test Circuit.		45		ns
Fall Time	tf	See specified Test Circuit.		35		ns
Total Gate Charge	Qg	VDS=−10V, VGS=−10V, ID=−4.5A		10		nC
Gate-to-Source Charge	Qgs	VDS=−10V, VGS=−10V, ID=−4.5A		2.0		nC
Gate-to-Drain “Miller” Charge	Qgd	VDS=−10V, VGS=−10V, ID=−4.5A		2.5		nC
Diode Forward Voltage	VSD	IS=−4.5A, VGS=0V		−0.85	−1.2	V

Switching Time Test Circuit

[N-channel]

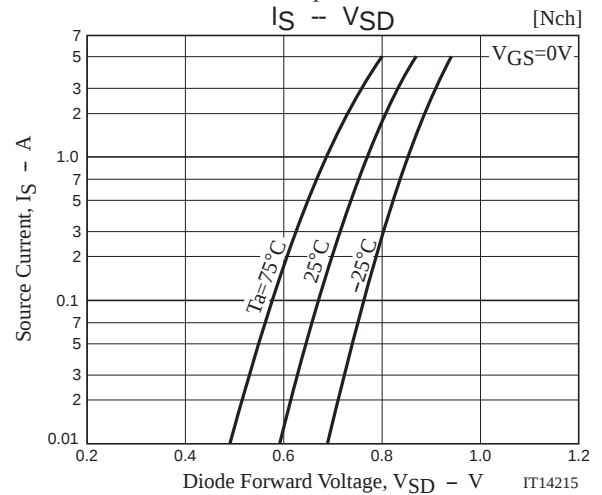
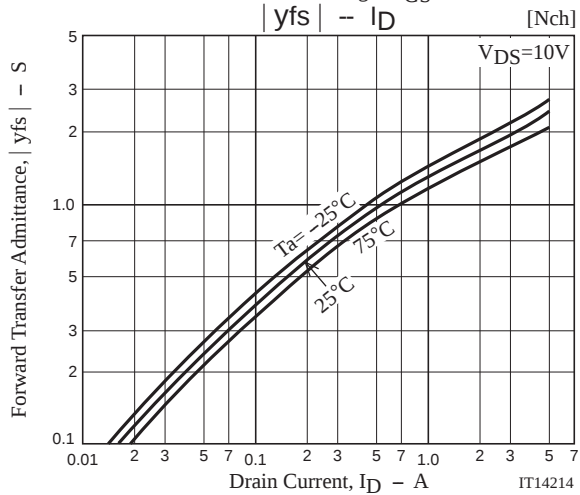
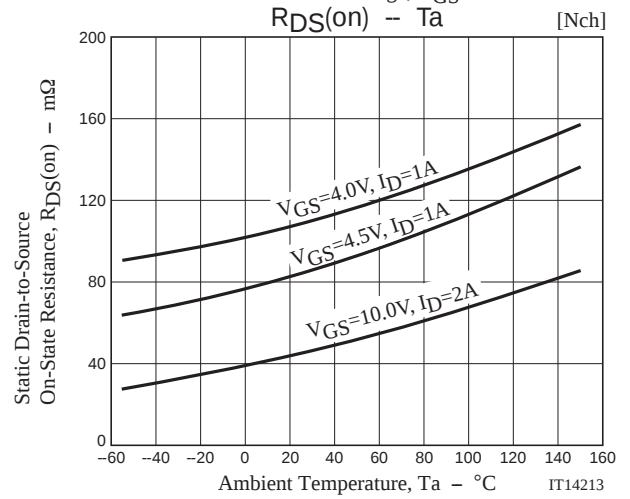
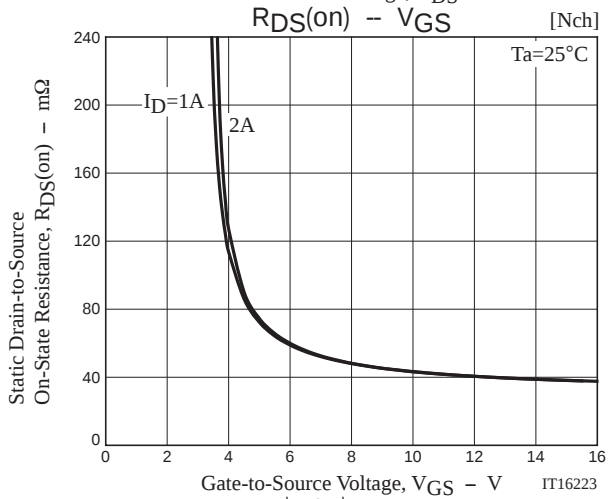
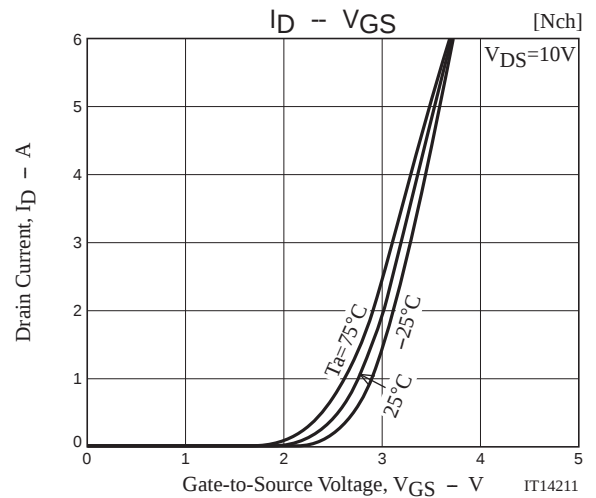
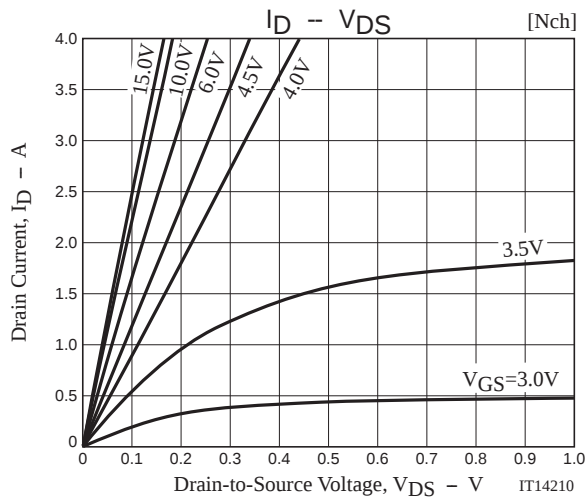


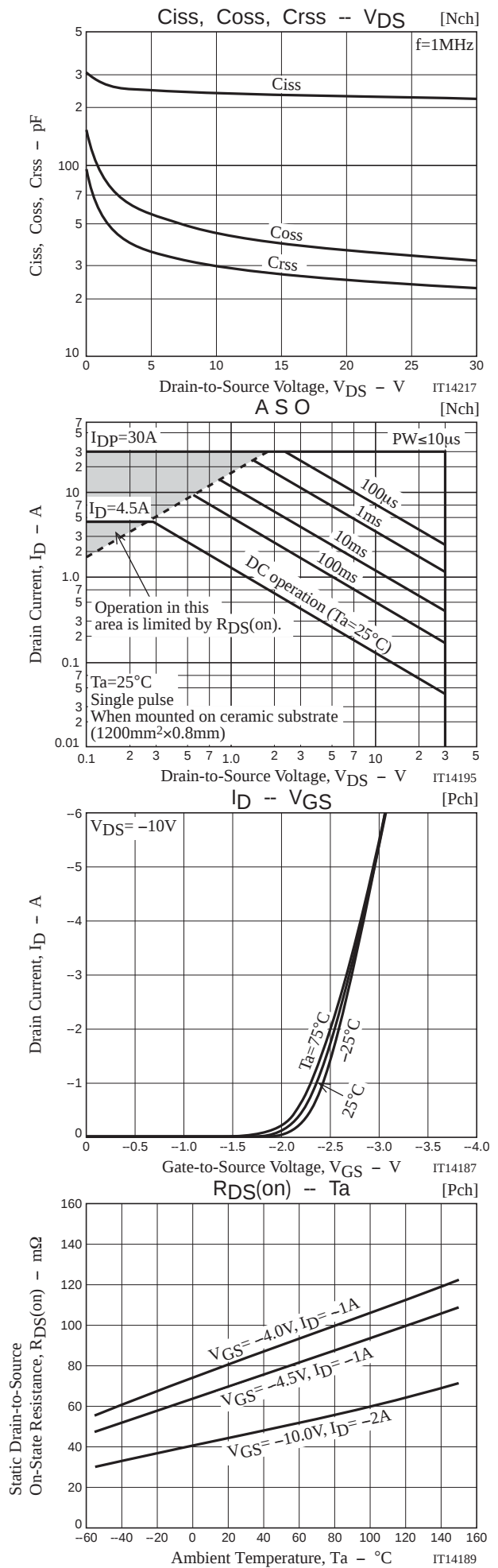
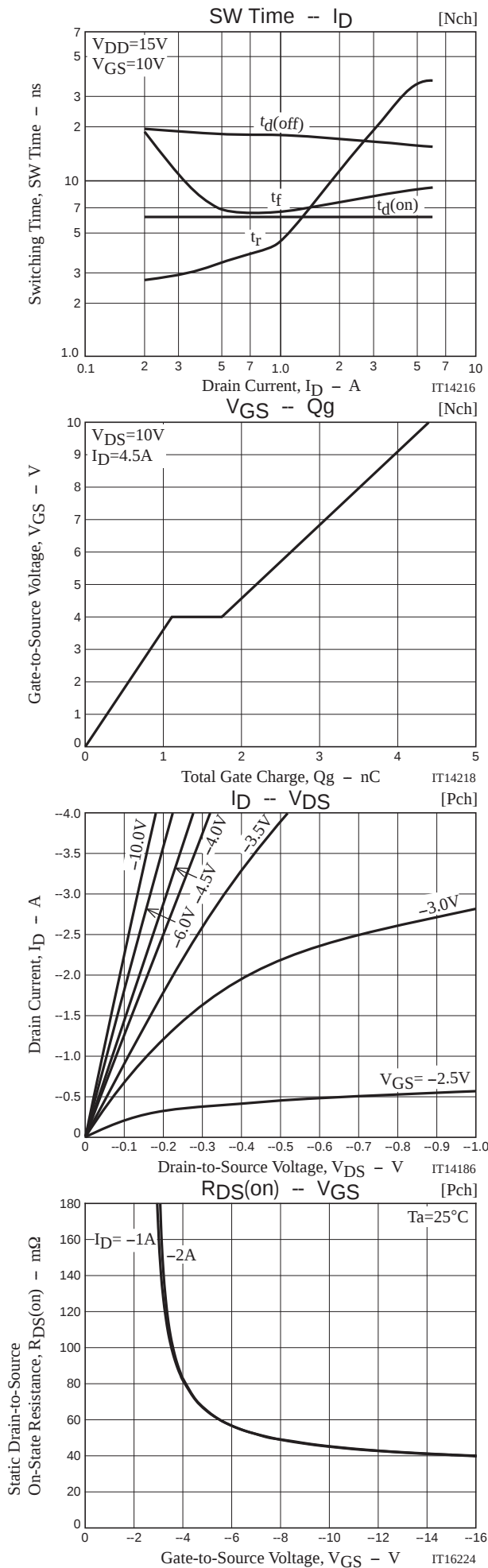
[P-channel]

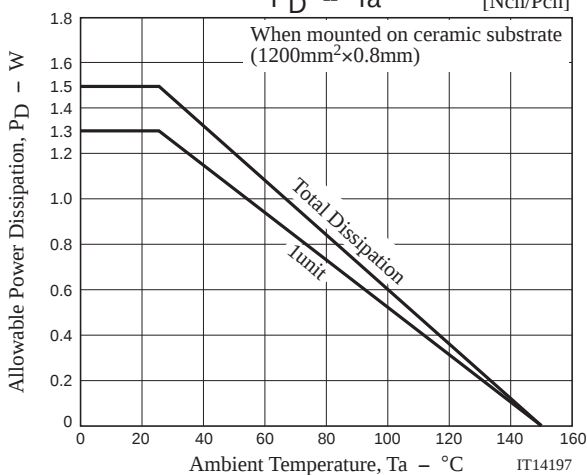
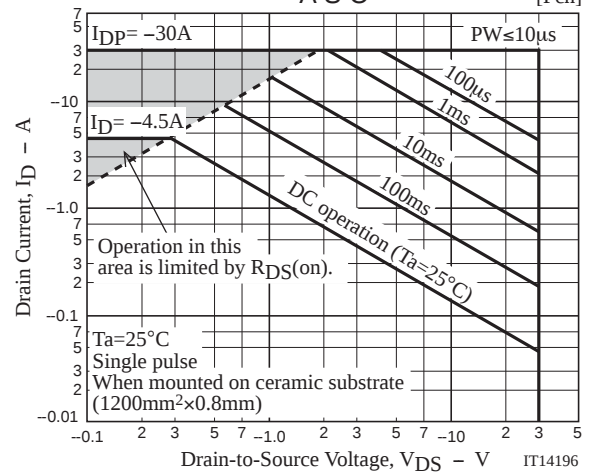
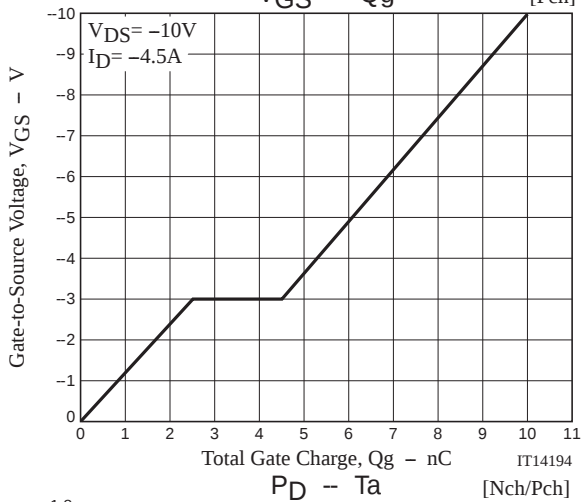
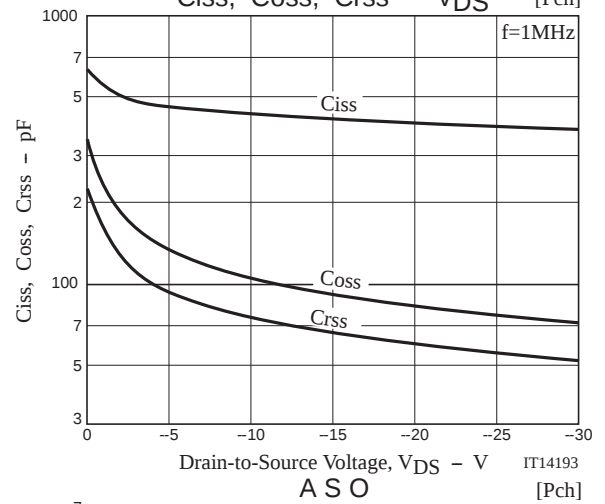
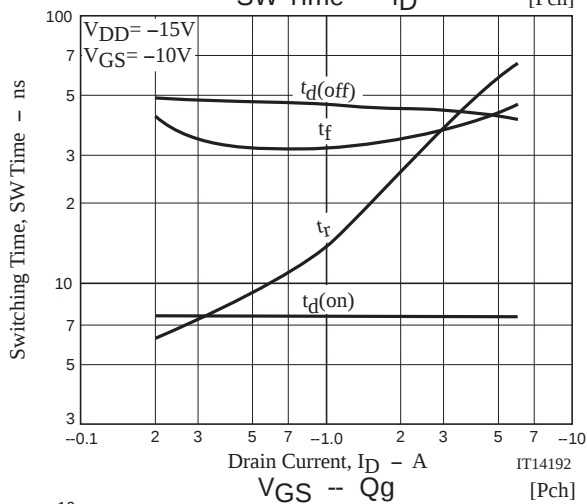
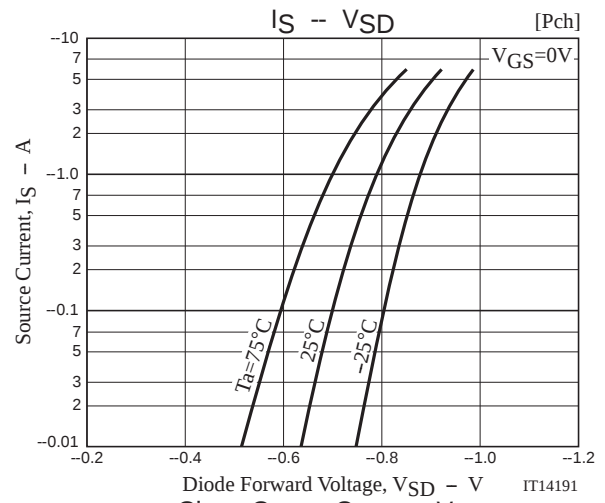
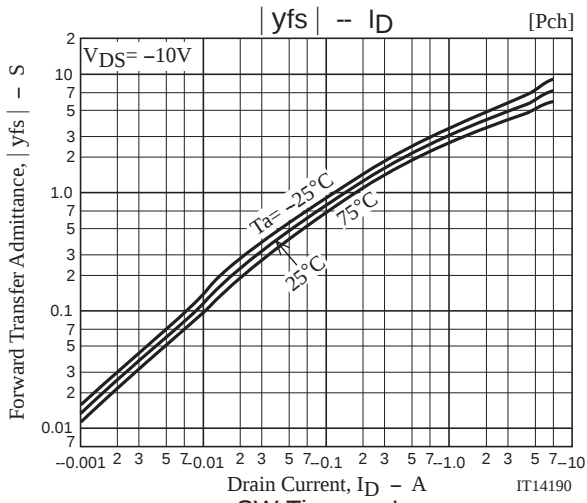


Ordering Information

Device	Package	Shipping	memo
ECH8660-TL-H	ECH8	3,000pcs./reel	Pb-Free and Halogen Free







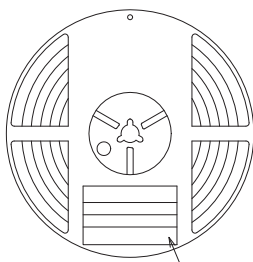
Embossed Taping Specification

ECH8660-TL-H

1. Packing Format

Package Name	Carrier Tape Type	Maximum Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	Inner BOX (C-1)	Outer BOX (A-7)
ECH8	CPH6	3,000	15,000	90,000	5 reels contained Dimensions:mm (external) 183×72×185	6 inner boxes contained Dimensions:mm (external) 440×195×210

Packing method



Reel label

Type No.
LOT No.
Quantity
Origin

Reel label, Inner box label
(unit:mm)

(P) TYPE	000000000
(1) LOT	00
(Q) QTY	0,000 (1) LEAD FREE *
(2) SPECIAL	
	20722005310C
	ASSEMBLY:**** (DIFFUSION:****)

Outer box label

It is a label at the time of factory shipments.
The form of a label may change in physical distribution process.

TYPE CODE	00000000000000000000
TYPE	00000000
QTY	0,000 PCS (1) LEAD FREE *
LOT	00000000
PACKAGE	00000000
SPECIAL	
	20722005310C
	ASSEMBLY:**** (DIFFUSION:****)

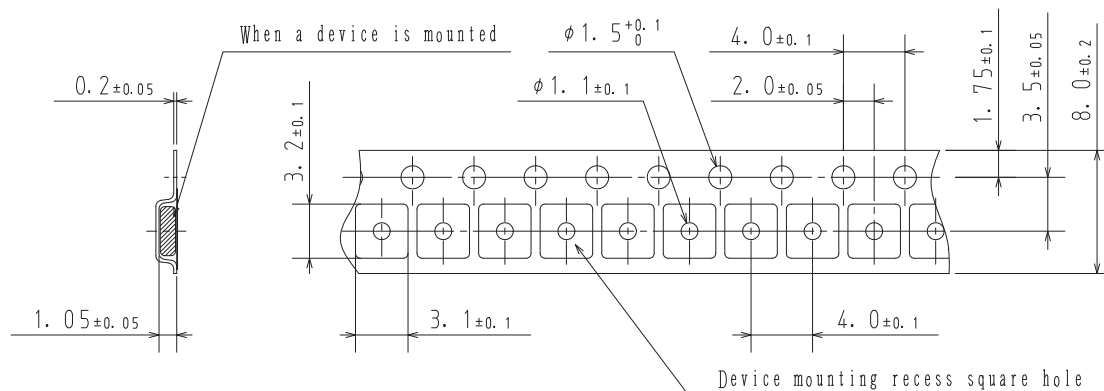
NOTE (1)

The LEAD FREE * description shows that the surface treatment of the terminal is lead free.

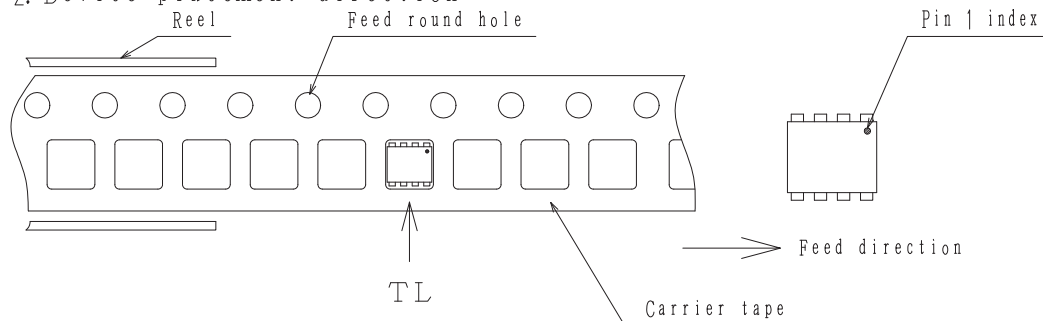
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

2-1. Carrier tape size (unit:mm)

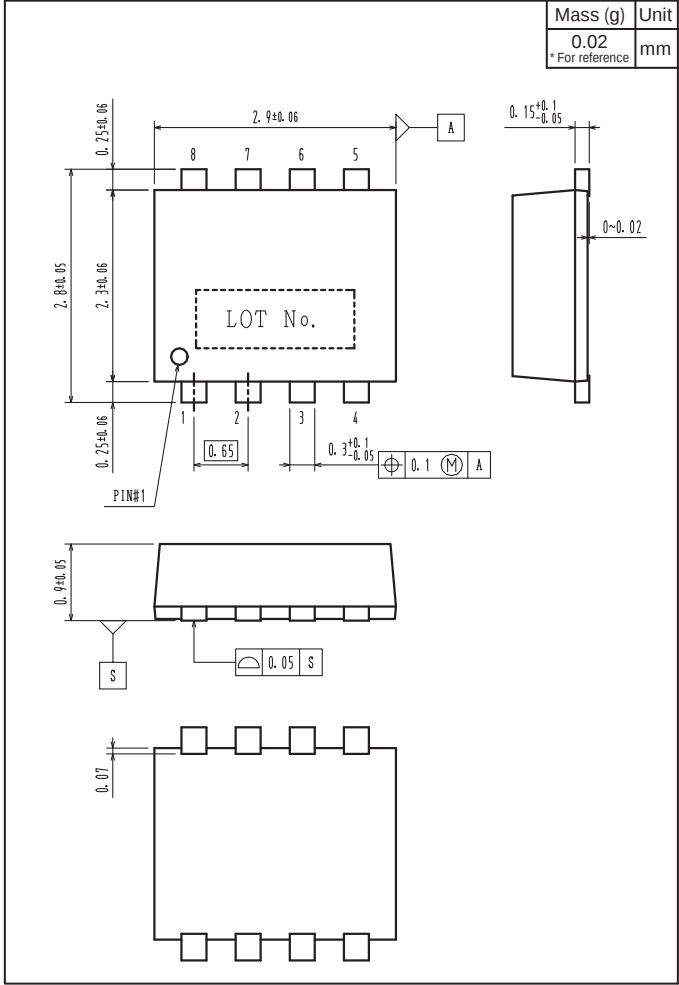


2-2. Device placement direction

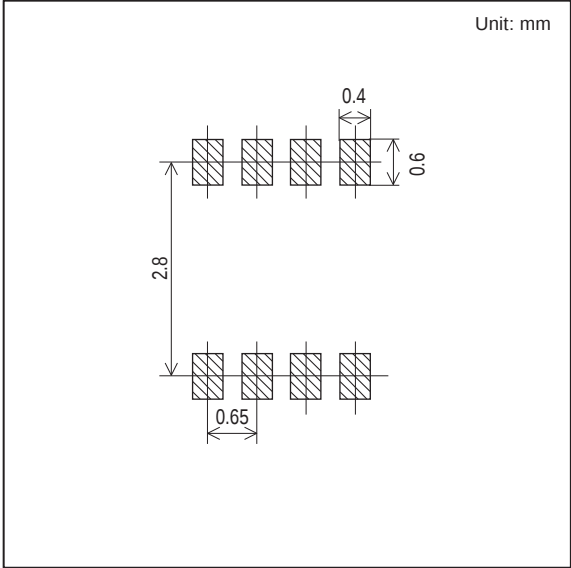


Those with pin 1 index on the feed hole side.....TL

Outline Drawing
ECH8660-TL-H



Land Pattern Example



Note on usage : Since the ECH8660 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

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