



# ECH8657 — General-Purpose Switching Device Applications

N-Channel Silicon MOSFET

## Features

- 4V drive
- Halogen free compliance
- Protection diode in

## Specifications

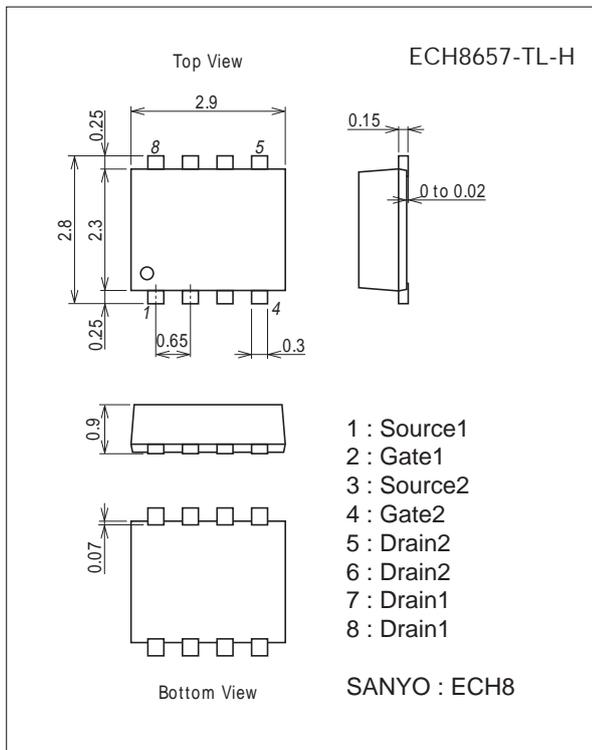
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	VDSS		35	V
Gate-to-Source Voltage	VGSS		±20	V
Drain Current (DC)	ID		4.5	A
Drain Current (Pulse)	IDP	PW≤10μs, duty cycle≤1%	30	A
Allowable Power Dissipation	PD	When mounted on ceramic substrate (1200mm <sup>2</sup> ×0.8mm) 1unit	1.3	W
Total Dissipation	PT	When mounted on ceramic substrate (1200mm <sup>2</sup> ×0.8mm)	1.5	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		-55 to +150	°C

## Package Dimensions

unit : mm (typ)

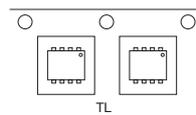
7011A-001



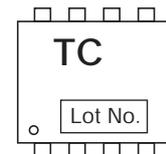
## Product & Package Information

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

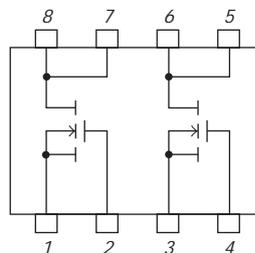
## Packing Type : TL



## Marking



## Electrical Connection

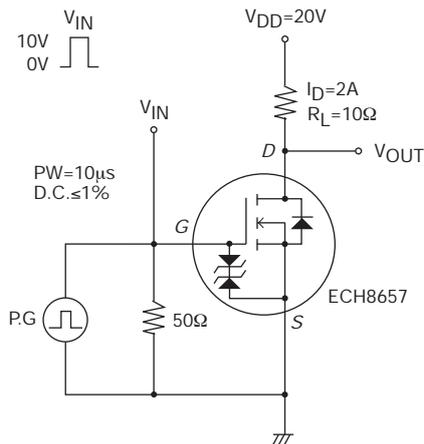


# ECH8657

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

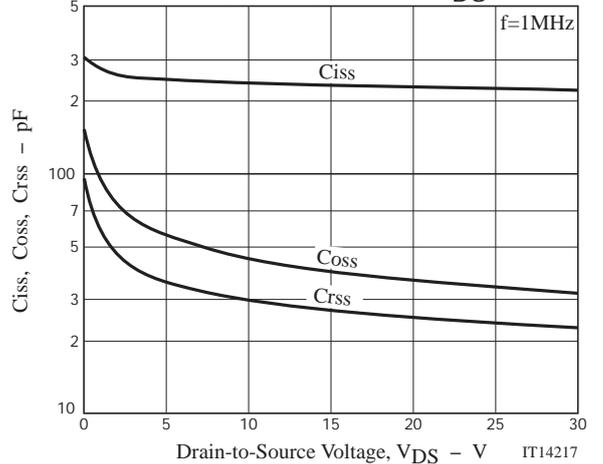
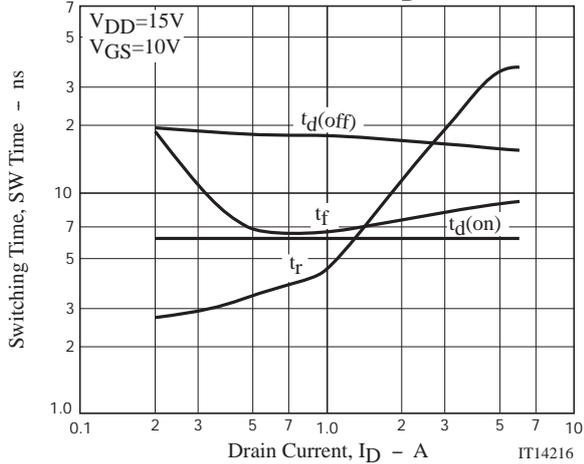
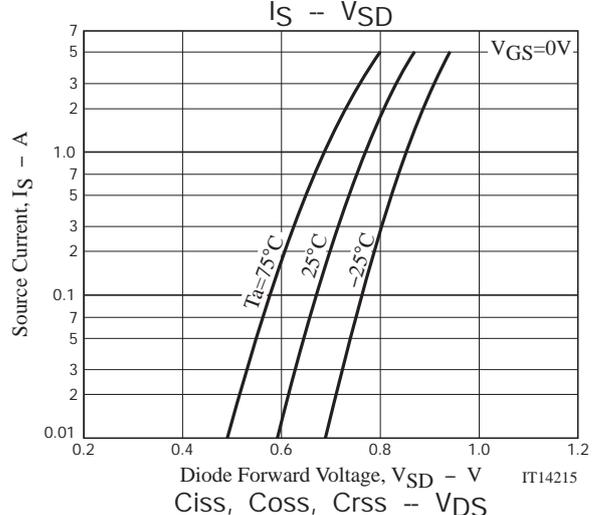
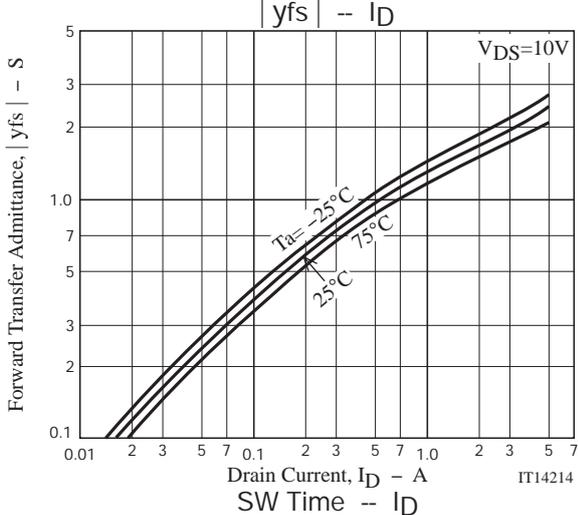
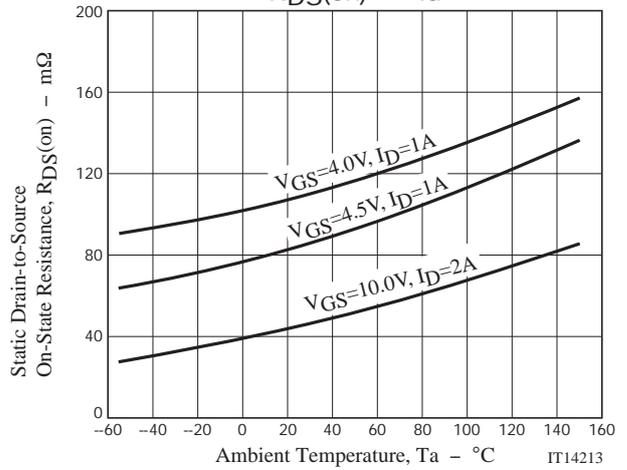
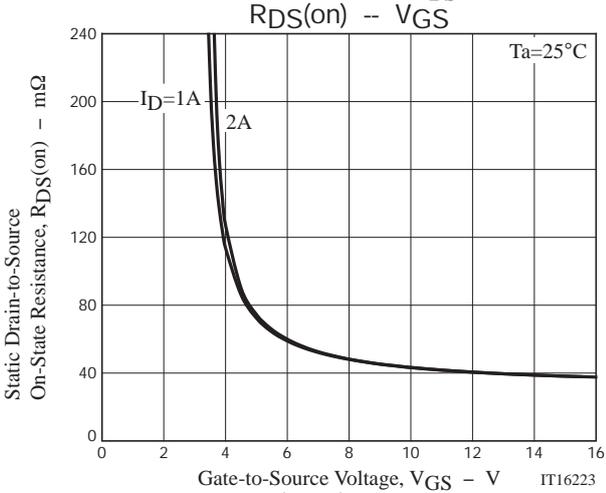
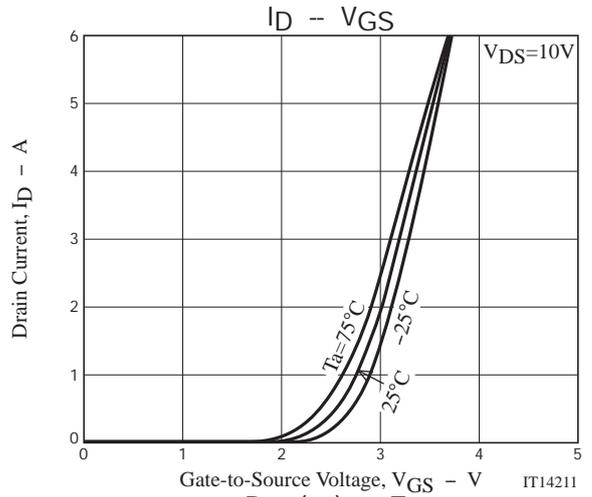
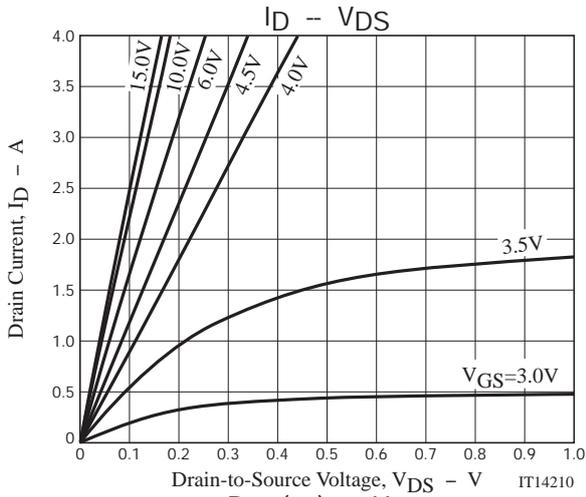
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1\text{mA}$ , $V_{GS}=0\text{V}$	35			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=35\text{V}$ , $V_{GS}=0\text{V}$			1	$\mu\text{A}$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 16\text{V}$ , $V_{DS}=0\text{V}$			$\pm 10$	$\mu\text{A}$
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10\text{V}$ , $I_D=1\text{mA}$	1.2		2.6	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10\text{V}$ , $I_D=2\text{A}$		1.66		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=2\text{A}$ , $V_{GS}=10\text{V}$		45	59	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=1\text{A}$ , $V_{GS}=4.5\text{V}$		85	119	$\text{m}\Omega$
	$R_{DS(on)3}$	$I_D=1\text{A}$ , $V_{GS}=4\text{V}$		110	155	$\text{m}\Omega$
Input Capacitance	$C_{iss}$			230		$\text{pF}$
Output Capacitance	$C_{oss}$	$V_{DS}=20\text{V}$ , $f=1\text{MHz}$		37		$\text{pF}$
Reverse Transfer Capacitance	$C_{rss}$			25		$\text{pF}$
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		6		ns
Rise Time	$t_r$			11		ns
Turn-OFF Delay Time	$t_{d(off)}$			17		ns
Fall Time	$t_f$			9		ns
Total Gate Charge	$Q_g$				4.6	
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=20\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=4.5\text{A}$		1.0		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$			1.0		nC
Diode Forward Voltage	$V_{SD}$		$I_S=4.5\text{A}$ , $V_{GS}=0\text{V}$		0.85	1.2

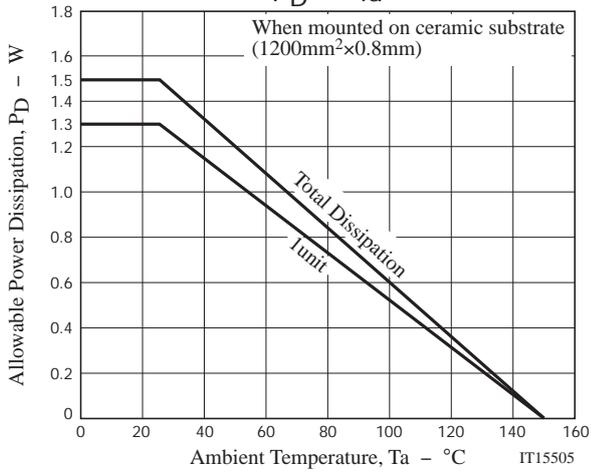
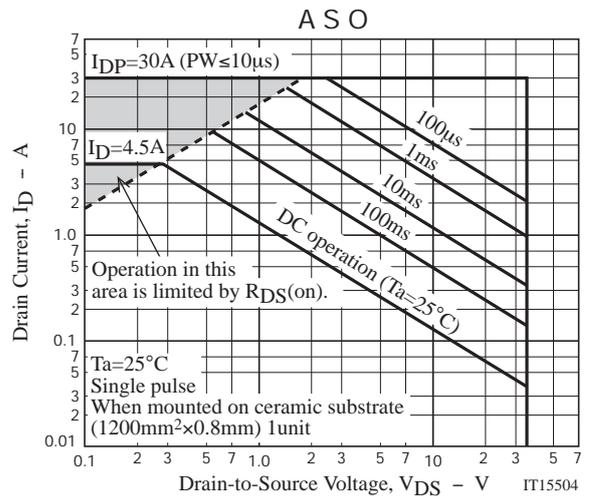
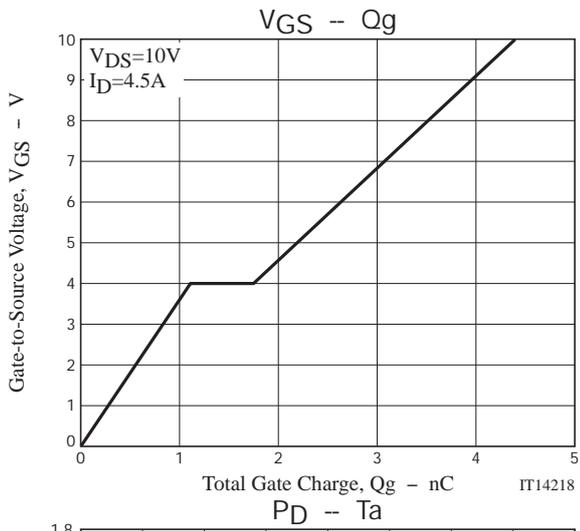
## Switching Time Test Circuit



## Ordering Information

Device	Package	Shipping	memo
ECH8657-TL-H	ECH8	3,000pcs./reel	Pb Free and Halogen Free





Embossed Taping Specification

ECH8657-TL-H

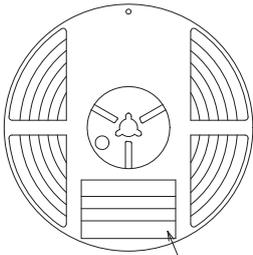
1. Packing Format

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

Reel label, Inner box label  
(unit :mm)

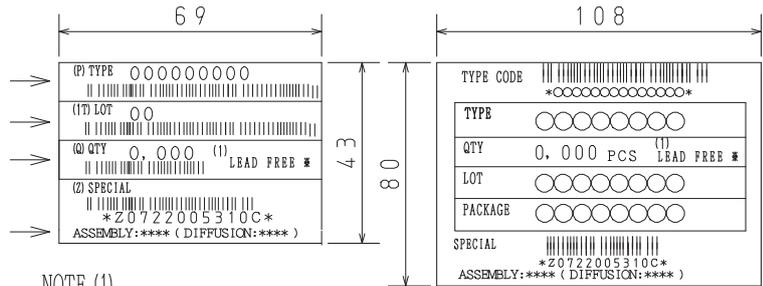
Outer box label  
It is a label at the time of factory shipments.  
The form of a label may change in physical distribution process.

Packing method



Reel label

Type No.  
LOT No.  
Quantity  
Origin



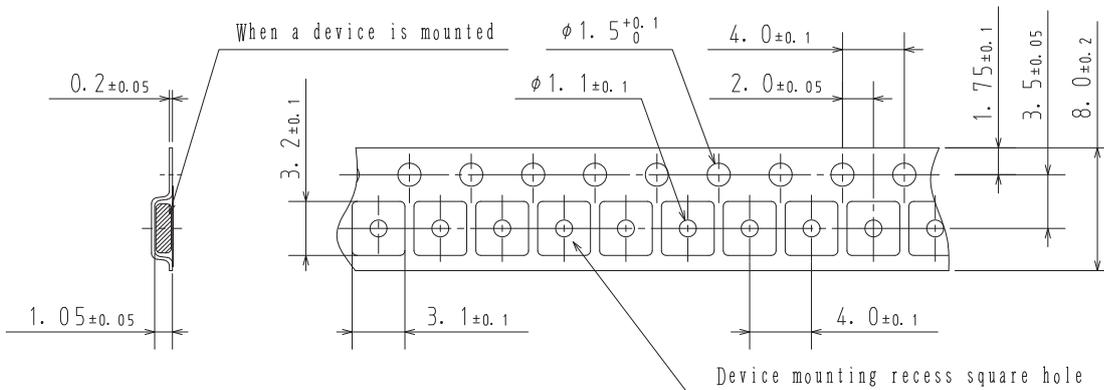
NOTE (1)

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

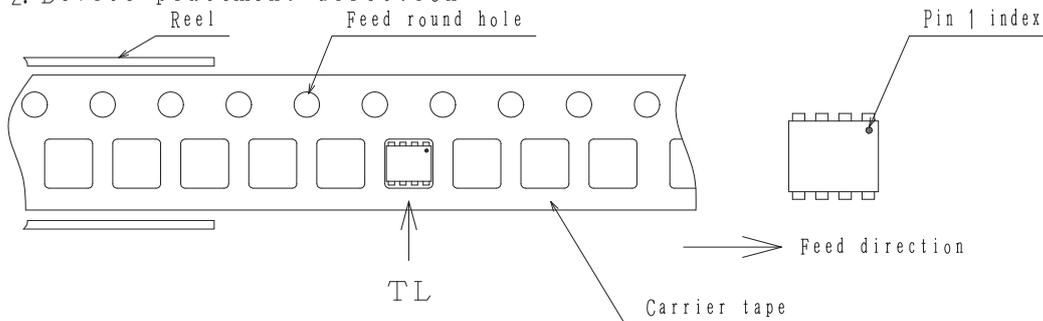
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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

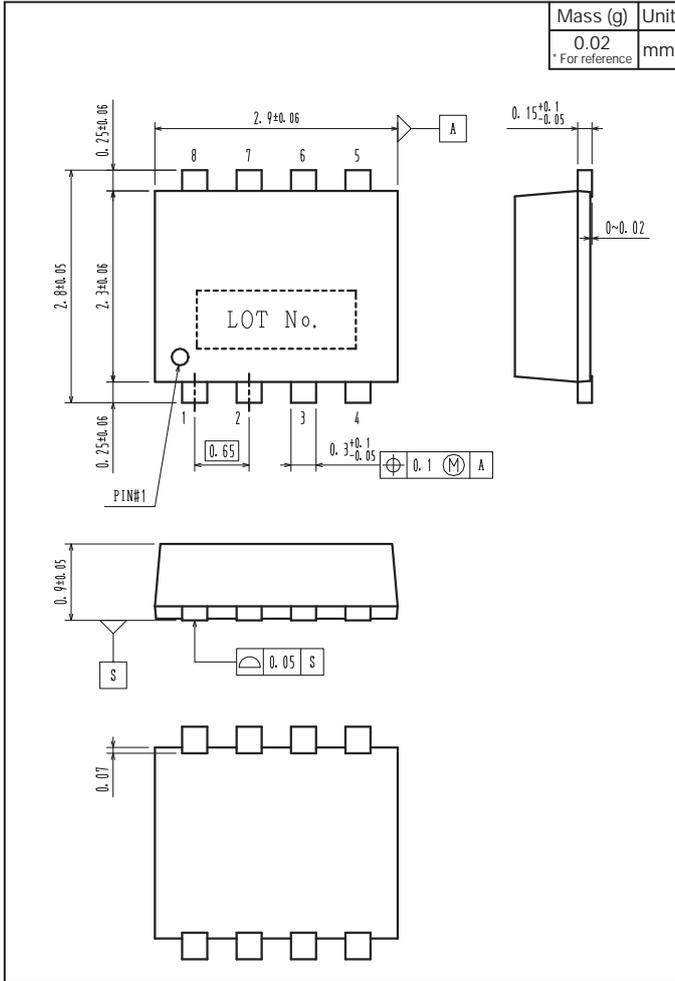


2-2. Device placement direction

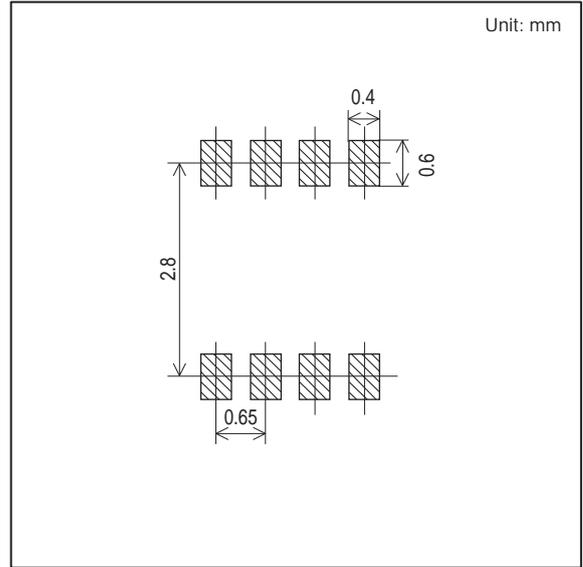


Those with pin 1 index on the feed hole side.....TL

Outline Drawing  
ECH8657-TL-H



Land Pattern Example



Note on usage : Since the ECH8657 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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