



# ECH8651R

## N-Channel Power MOSFET 24V, 10A, 14mΩ, Dual ECH8

ON Semiconductor®

<http://onsemi.com>

### Features

- Low ON-resistance
- 2.5V drive
- Common-drain type
- Protection diode in
- Built-in gate protection resistor
- Best suited for LiB charging and discharging switch
- Halogen free compliance

### Specifications

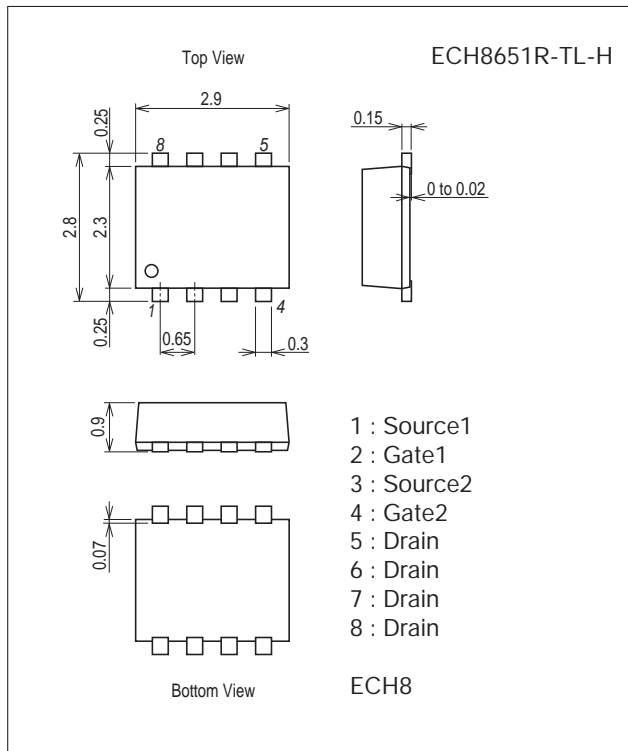
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V <sub>DSS</sub>		24	V
Gate-to-Source Voltage	V <sub>GSS</sub>		±12	V
Drain Current (DC)	I <sub>D</sub>		10	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	60	A
Allowable Power Dissipation	P <sub>D</sub>	When mounted on ceramic substrate (900mm²×0.8mm) 1unit	1.4	W
Total Dissipation	P <sub>T</sub>	When mounted on ceramic substrate (900mm²×0.8mm)	1.5	W
Channel Temperature	T <sub>ch</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

### Package Dimensions

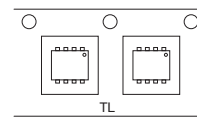
unit : mm (typ)  
7011A-003



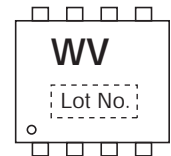
### Product & Package Information

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

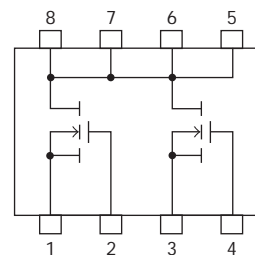
### Packing Type : TL



### Marking



### Electrical Connection

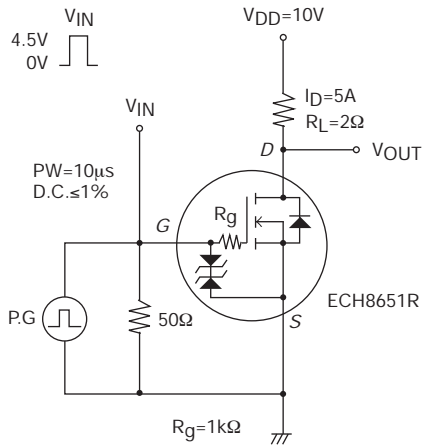


# ECH8651R

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1\text{mA}$ , $V_{GS}=0\text{V}$	24			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	$V_{GS(off)}$	$V_{DS}=10\text{V}$ , $I_D=1\text{mA}$	0.5		1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10\text{V}$ , $I_D=5\text{A}$	5.5	9.5		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=5\text{A}$ , $V_{GS}=4.5\text{V}$	7	10.5	14	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=5\text{A}$ , $V_{GS}=4.0\text{V}$	7.2	11	15	$\text{m}\Omega$
	$R_{DS(on)3}$	$I_D=5\text{A}$ , $V_{GS}=3.1\text{V}$	7.5	12.5	17.5	$\text{m}\Omega$
	$R_{DS(on)4}$	$I_D=2.5\text{A}$ , $V_{GS}=2.5\text{V}$	9	15	21	$\text{m}\Omega$
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		300		ns
Rise Time	$t_r$			1000		ns
Turn-OFF Delay Time	$t_{d(off)}$			4000		ns
Fall Time	$t_f$			2500		ns
Total Gate Charge	$Q_g$			24		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=10\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=10\text{A}$		2		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$			4.5		nC
Diode Forward Voltage	$V_{SD}$		$I_S=10\text{A}$ , $V_{GS}=0\text{V}$		0.77	1.2

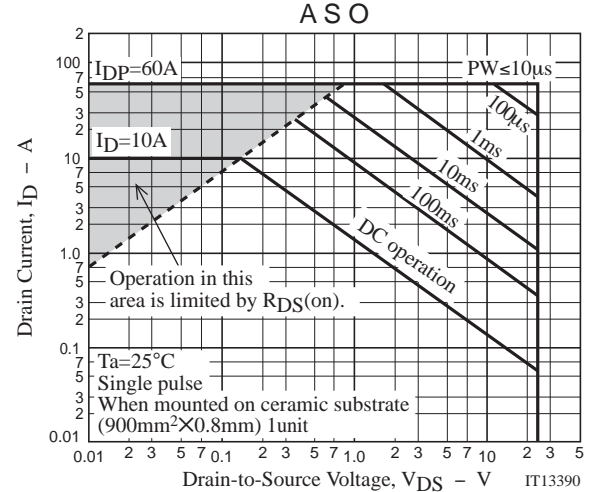
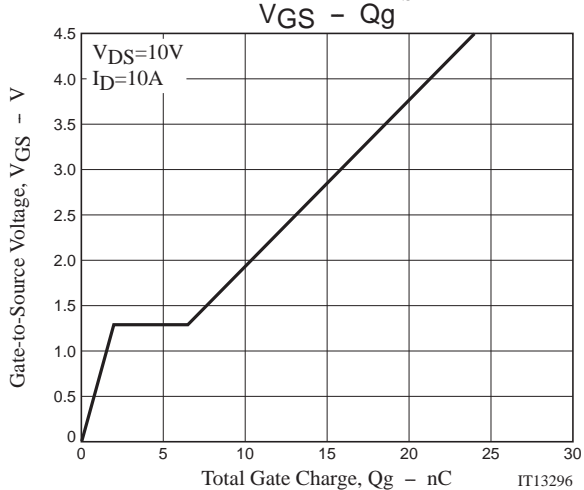
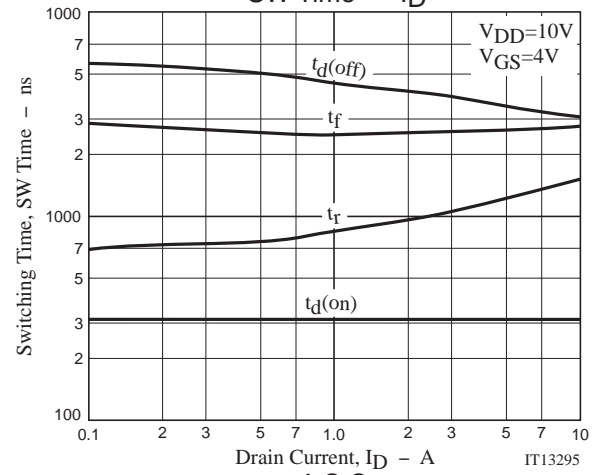
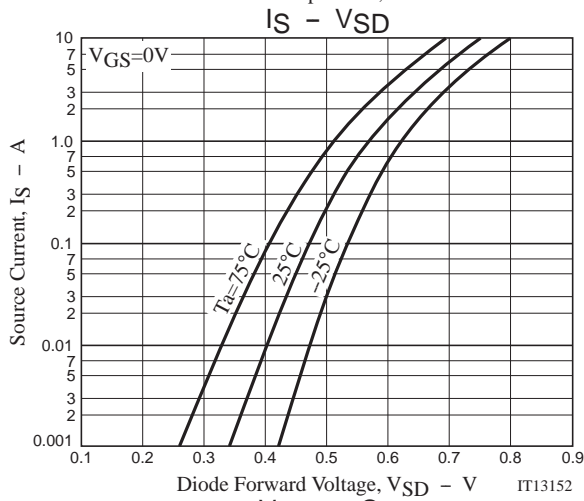
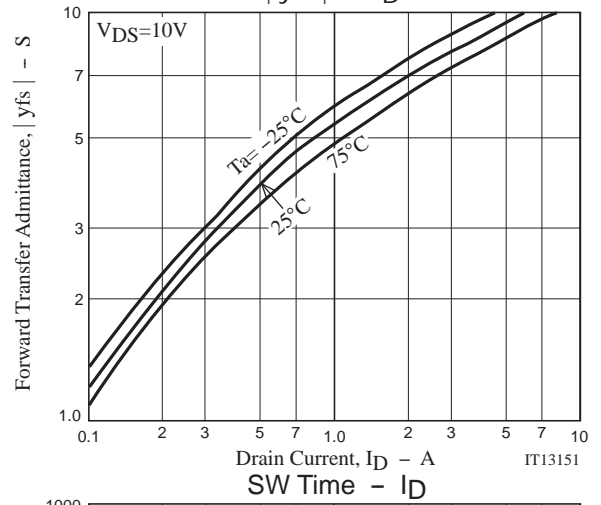
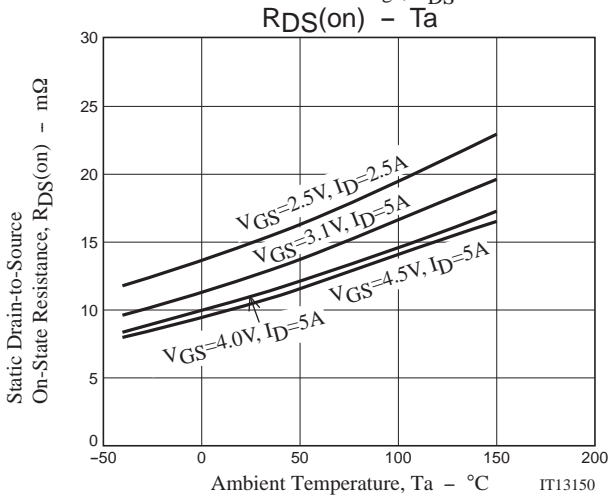
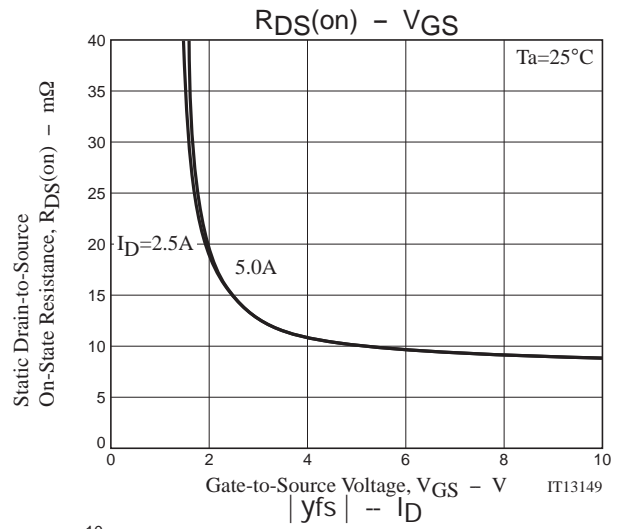
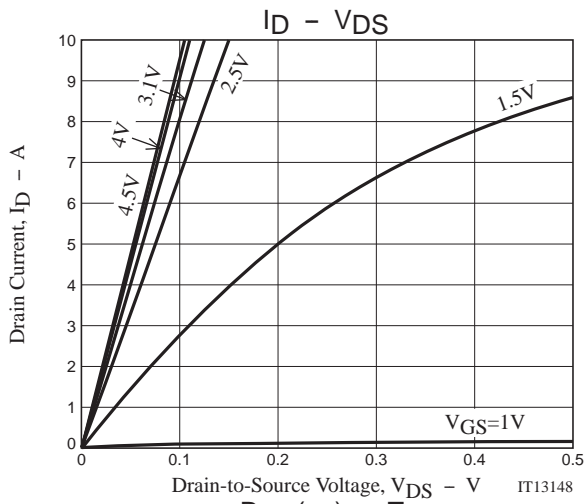
## Switching Time Test Circuit

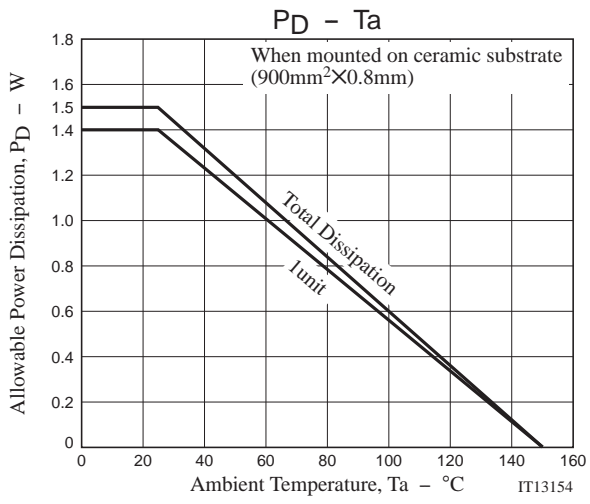


## Ordering Information

Device	Package	Shipping	memo
ECH8651R-TL-H	ECH8	3,000pcs./reel	Pb Free and Halogen Free

# ECH8651R





# ECH8651R

## Embossed Taping Specification

ECH8651R-TL-H

### 1. Packing Format

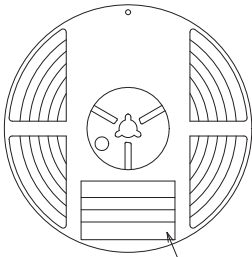
Package Name	Carrier Tape Type	Maximum Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	Inner BOX (C-1)	Outer BOX (A-7)
ECH8	CPH6	3,000	15,000	90,000	5 reels contained Dimensions:mm (external) 183×72×185	6 inner boxes contained Dimensions:mm (external) 440×195×210

Reel label, Inner box label  
(unit :mm)

Outer box label

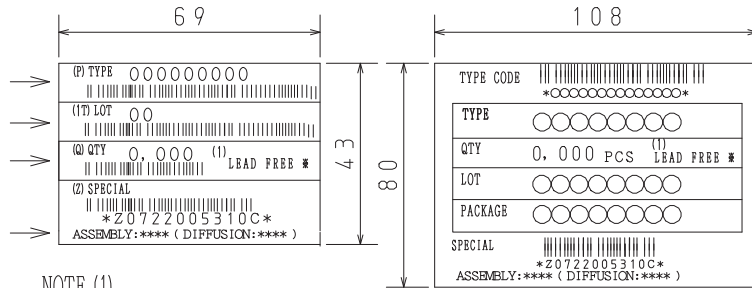
It is a label at the time of factory shipments.  
The form of a label may change in physical distribution process.

#### Packing method



Reel label

Type No.  
LOT No.  
Quantity  
Origin



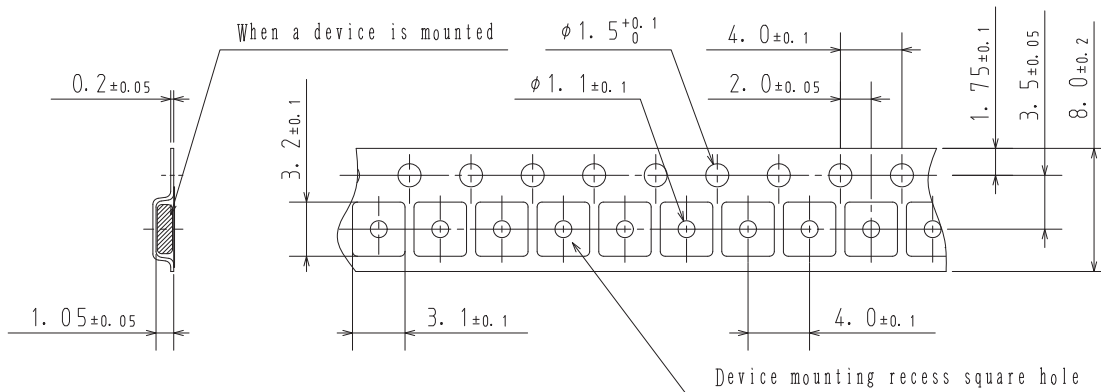
NOTE (1)

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

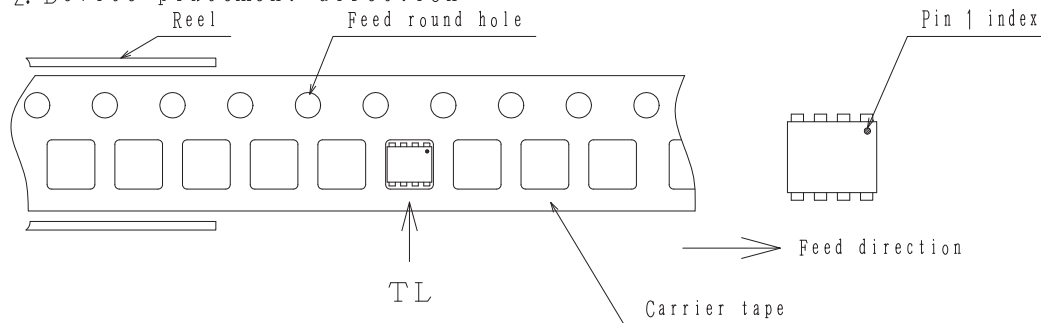
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

### 2. Taping configuration

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



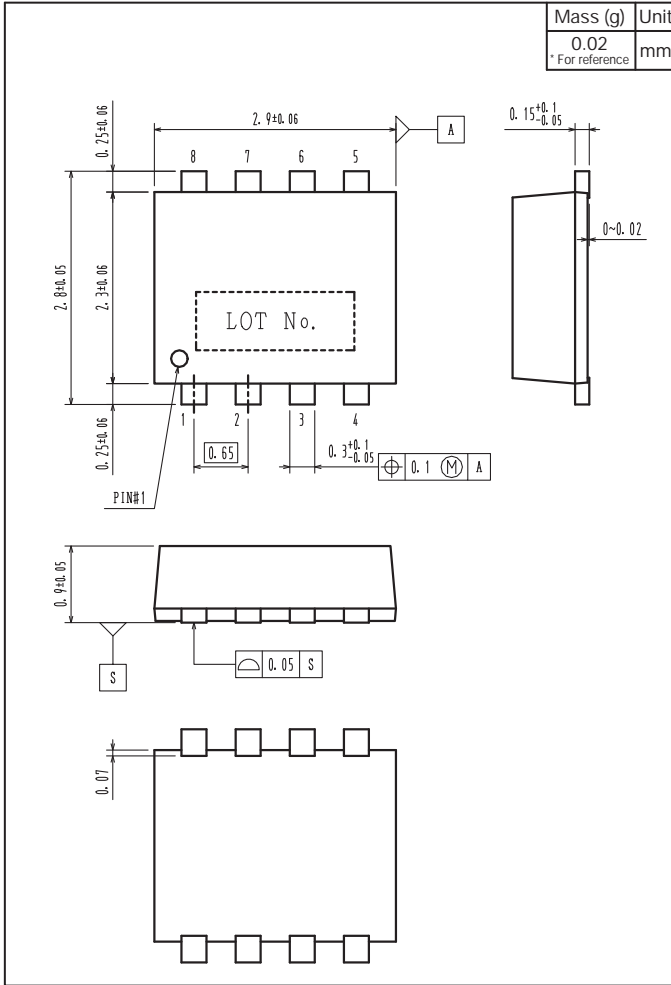
#### 2-2. Device placement direction



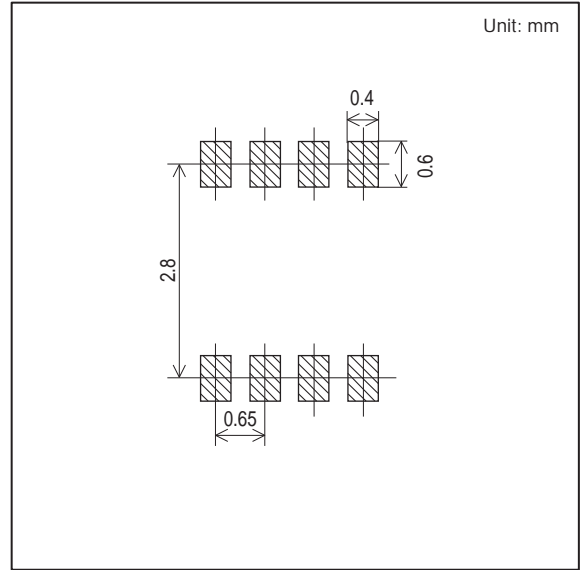
Those with pin 1 index on the feed hole side.....TL

# ECH8651R

## Outline Drawing ECH8651R-TL-H



## Land Pattern Example



Note on usage : Since the ECH8651R is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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