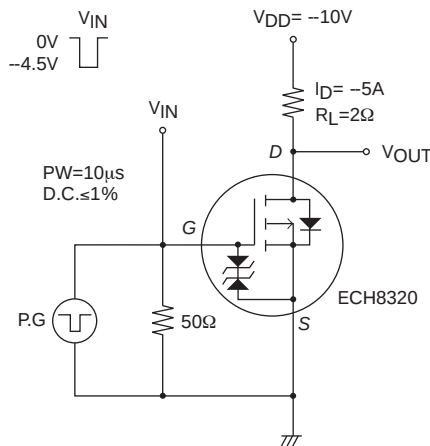


# ECH8320

## Electrical Characteristics at Ta=25°C

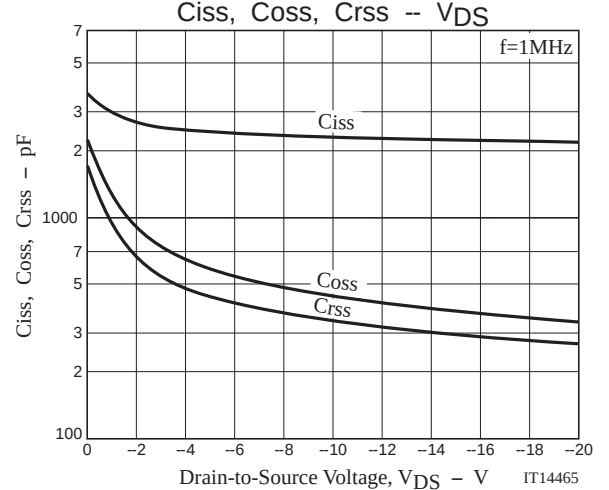
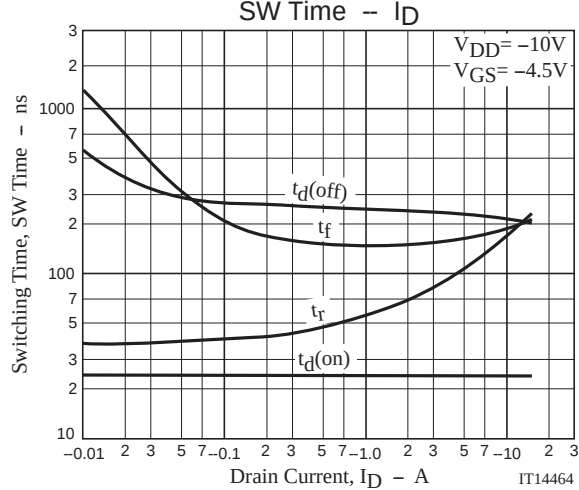
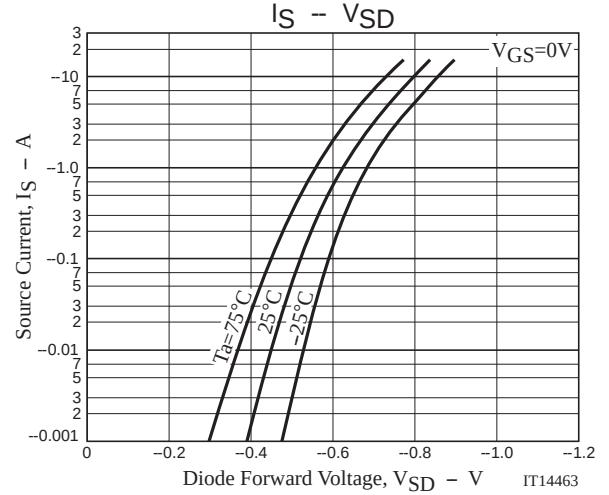
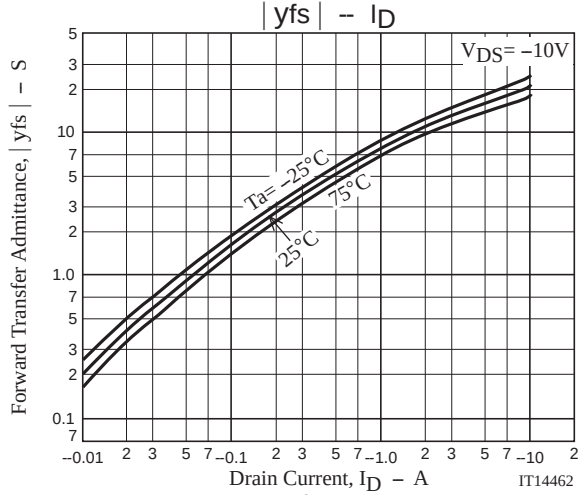
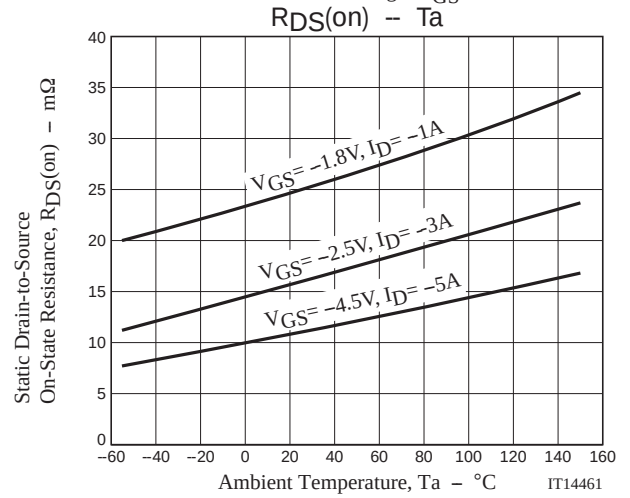
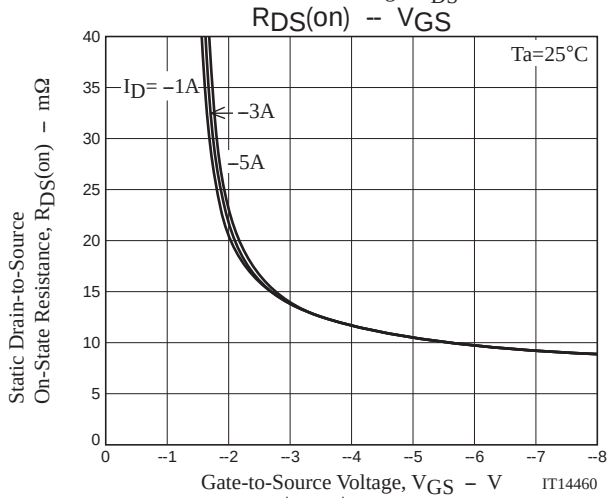
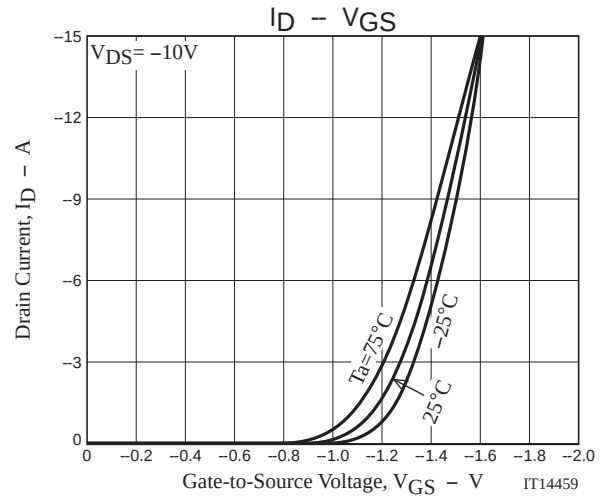
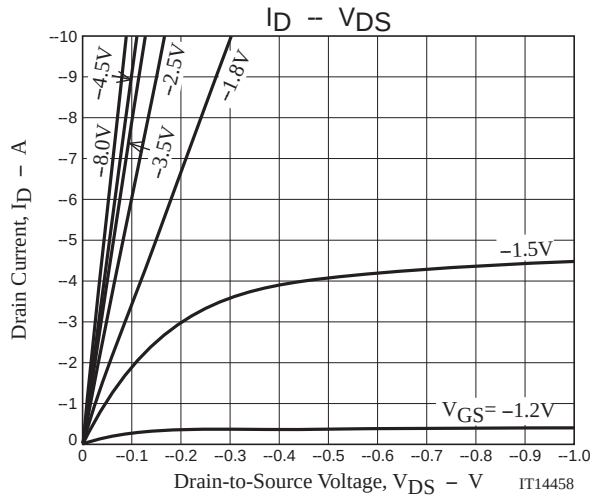
| Parameter                                  | Symbol        | Conditions                                   | Ratings |       |          | Unit      |
|--------------------------------------------|---------------|----------------------------------------------|---------|-------|----------|-----------|
|                                            |               |                                              | min     | typ   | max      |           |
| Drain-to-Source Breakdown Voltage          | $V_{(BR)DSS}$ | $I_D = -1mA, V_{GS} = 0V$                    | -20     |       |          | V         |
| Zero-Gate Voltage Drain Current            | $I_{DSS}$     | $V_{DS} = -20V, V_{GS} = 0V$                 |         |       | -1       | $\mu A$   |
| Gate-to-Source Leakage Current             | $I_{GSS}$     | $V_{GS} = \pm 8V, V_{DS} = 0V$               |         |       | $\pm 10$ | $\mu A$   |
| Cutoff Voltage                             | $V_{GS(off)}$ | $V_{DS} = -10V, I_D = -1mA$                  | -0.4    |       | -1.3     | V         |
| Forward Transfer Admittance                | $ y_{fs} $    | $V_{DS} = -10V, I_D = -5A$                   |         | 16    |          | S         |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)1}$ | $I_D = -5A, V_{GS} = -4.5V$                  |         | 11    | 14.5     | $m\Omega$ |
|                                            | $R_{DS(on)2}$ | $I_D = -3A, V_{GS} = -2.5V$                  |         | 16    | 23       | $m\Omega$ |
|                                            | $R_{DS(on)3}$ | $I_D = -1A, V_{GS} = -1.8V$                  |         | 25    | 39       | $m\Omega$ |
| Input Capacitance                          | $C_{iss}$     | $V_{DS} = -10V, f = 1MHz$                    |         | 2300  |          | pF        |
| Output Capacitance                         | $C_{oss}$     | $V_{DS} = -10V, f = 1MHz$                    |         | 440   |          | pF        |
| Reverse Transfer Capacitance               | $C_{rss}$     | $V_{DS} = -10V, f = 1MHz$                    |         | 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                          | $Q_g$         | $V_{DS} = -10V, V_{GS} = -4.5V, I_D = -9.5A$ |         | 25    |          | nC        |
| Gate-to-Source Charge                      | $Q_{gs}$      | $V_{DS} = -10V, V_{GS} = -4.5V, I_D = -9.5A$ |         | 3.6   |          | nC        |
| Gate-to-Drain "Miller" Charge              | $Q_{gd}$      | $V_{DS} = -10V, V_{GS} = -4.5V, I_D = -9.5A$ |         | 7.6   |          | nC        |
| Diode Forward Voltage                      | $V_{SD}$      | $I_S = -9.5A, V_{GS} = 0V$                   |         | -0.79 | -1.2     | V         |

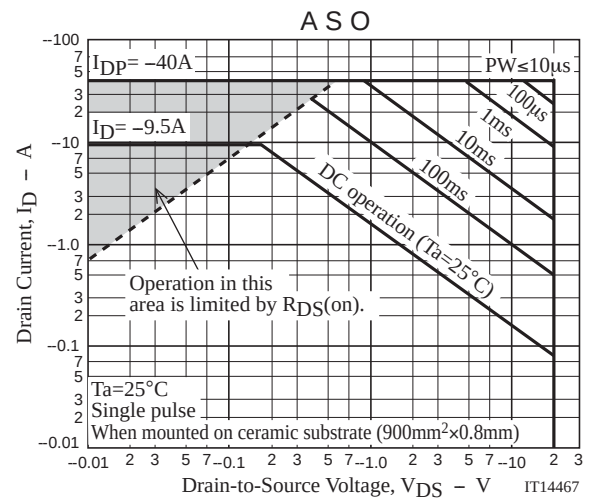
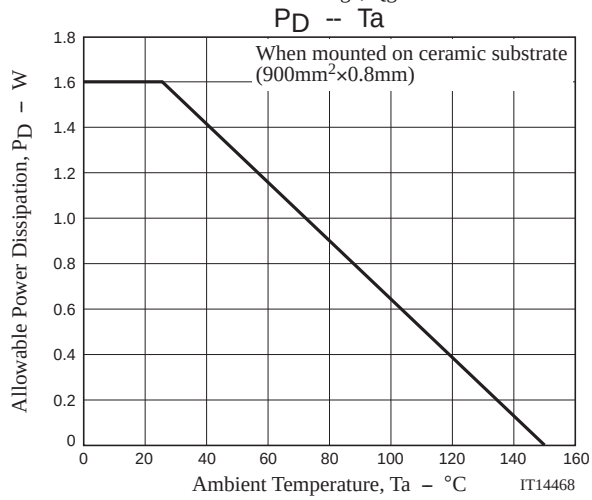
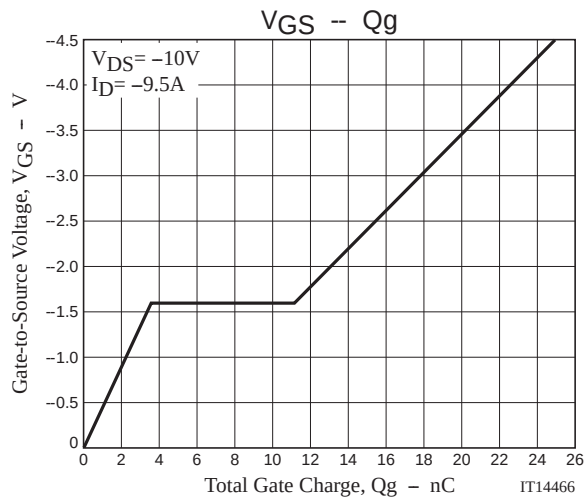
## Switching Time Test Circuit



## Ordering Information

| Device       | Package | Shipping       | memo                     |
|--------------|---------|----------------|--------------------------|
| ECH8320-TL-H | ECH8    | 3,000pcs./reel | Pb Free and Halogen Free |





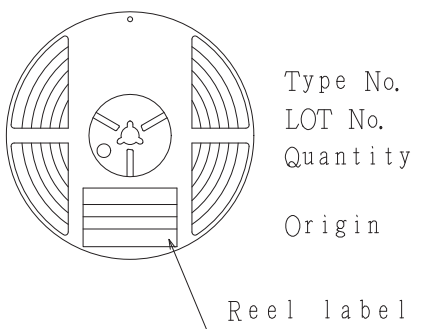
## Embossed Taping Specification

ECH8320-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<br>Dimensions:mm (external)<br>183×72×185 | 6 inner boxes contained<br>Dimensions:mm (external)<br>440×195×210 |

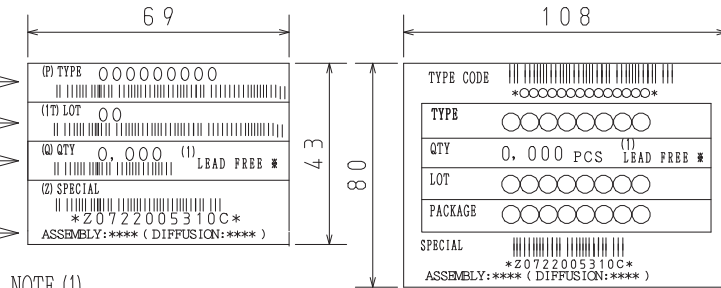
## Packing method



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.



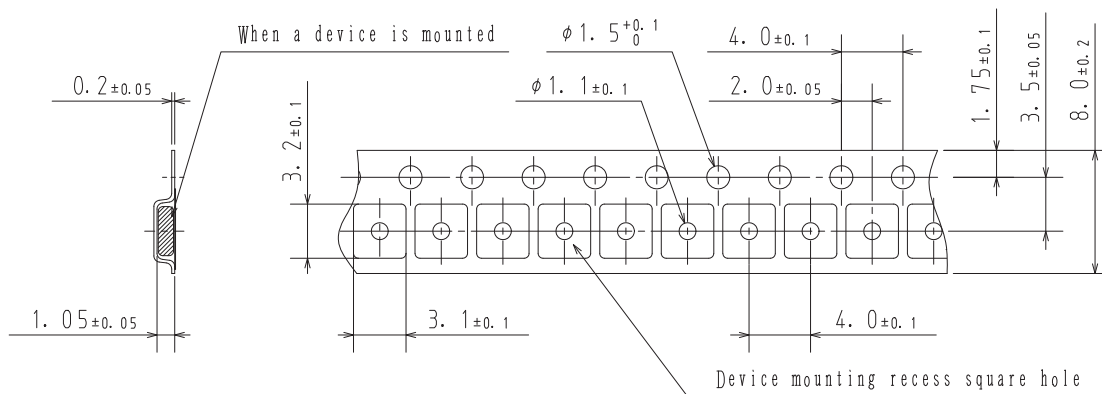
NOTE (1)

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

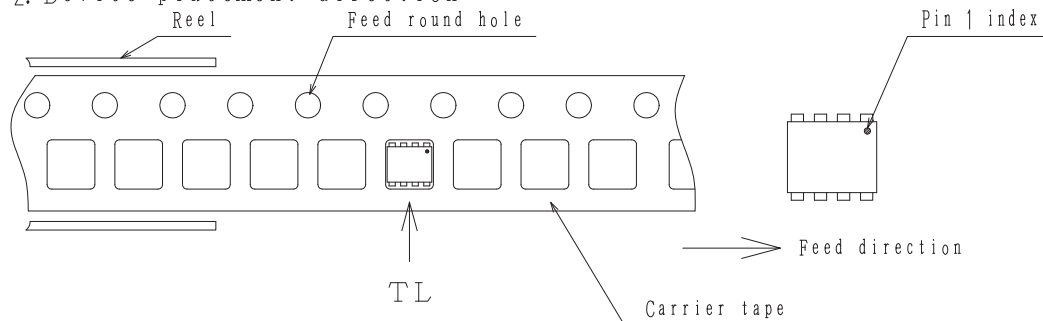
| Label       | JEITA Phase    |
|-------------|----------------|
| LEAD FREE 3 | JEITA Phase 3A |
| LEAD FREE 4 | JEITA Phase 3  |

## 2. Taping configuration

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

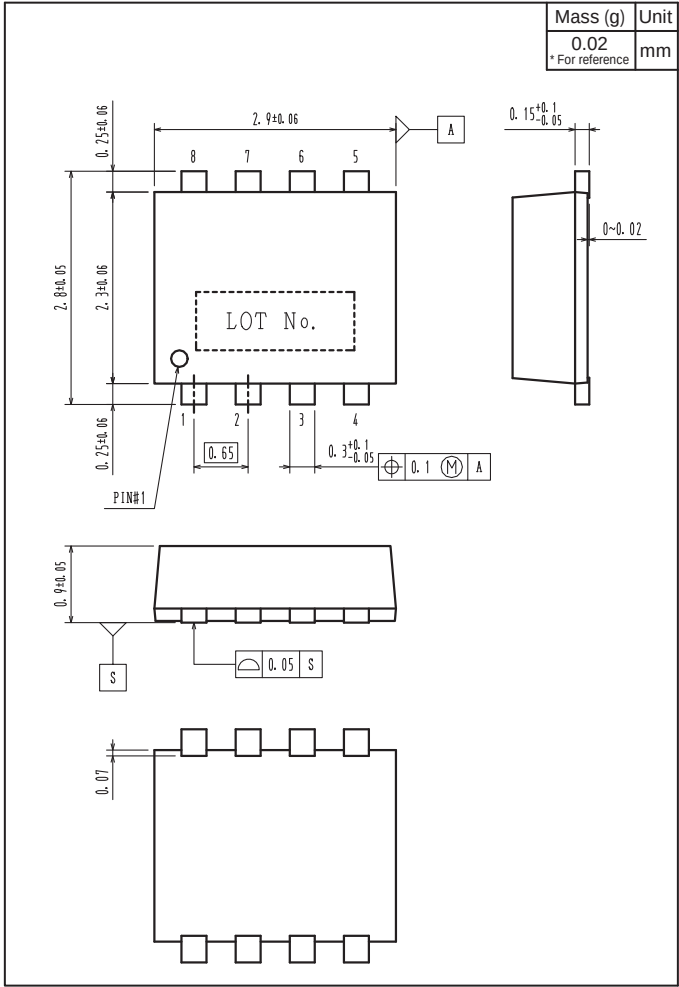


## 2-2. Device placement direction

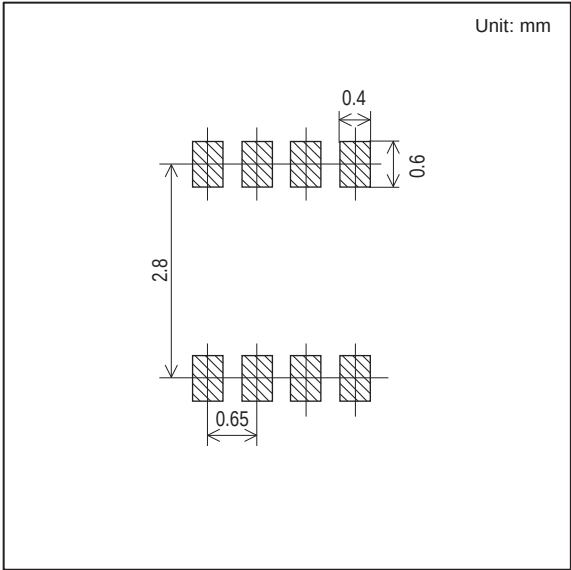


Those with pin 1 index on the feed hole side.....TL

Outline Drawing  
ECH8320-TL-H



Land Pattern Example



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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