

### ■ Features

- High surge current capability
- No reverse recovery
- Positive Temperature Coefficient
- Easy to paralleling
- Halogen-free / RoHS compliant
- Compliance with EU REACH

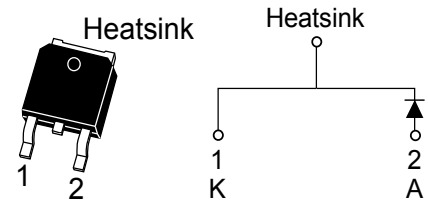
### ■ Benefits

- High-speed switching
- Low heat dissipation requirements
- Reduce size and cost of the system
- High-reliability
- System efficiency improvement

### ■ Applications

- Solar inverter
- Power factor correction
- Data Center
- Switch mode power supply

|           |                                 |
|-----------|---------------------------------|
| $V_{RRM}$ | 650V                            |
| $I_F$     | 8A( $T_c=156^{\circ}\text{C}$ ) |
| $Q_C$     | 21nC                            |



Package:TO-252-2L

ECR865DCS-HF

HF=Halogen Free

### Absolute Maximum Ratings ( $T_c=25^{\circ}\text{C}$ )

| Symbol          | Parameter                                     |                                                                    | Data           | Unit                 |
|-----------------|-----------------------------------------------|--------------------------------------------------------------------|----------------|----------------------|
| $V_{RRM}$       | Repetitive Peak Reverse Voltage               |                                                                    | 650            | V                    |
| $I_F$           | Continuous Forward Current                    | $T_c=25^{\circ}\text{C}$                                           | 31             | A                    |
|                 |                                               | $T_c=135^{\circ}\text{C}$                                          | 14             | A                    |
|                 |                                               | $T_c=156^{\circ}\text{C}$                                          | 8              | A                    |
| $I_{FSM}$       | Non-Repetitive Forward Surge Current          | $T_c=25^{\circ}\text{C}, T_p=8.3\text{mS}, \text{Half Sine Pulse}$ | 70             | A                    |
| $P_{tot}$       | Power Dissipation                             | $T_c=25^{\circ}\text{C}$                                           | 107            | W                    |
| $T_J$           | Operating Junction Temperature                |                                                                    | $-55 \sim 175$ | $^{\circ}\text{C}$   |
| $T_{STG}$       | Storage Temperature                           |                                                                    | $-55 \sim 175$ | $^{\circ}\text{C}$   |
| $R_{\theta JC}$ | Thermal Resistance Junction to Case (per leg) |                                                                    | TYP:1.4        | $^{\circ}\text{C/W}$ |



## Electricity Character Per Diode (Tc=25°C)

| Item  | Test Condition                |          | Value(min) | Value(typ) | Value(max) | Unit |
|-------|-------------------------------|----------|------------|------------|------------|------|
| $V_B$ | —                             | Tc=25°C  | 650        | —          | —          | V    |
| $V_F$ | IF=8A                         | Tc=25°C  | —          | 1.27       | 1.5        | V    |
|       |                               | Tc=175°C | —          | 1.38       | —          | V    |
| $I_R$ | VR=650V                       | Tc=25°C  | —          | 5          | 50         | uA   |
|       |                               | Tc=175°C | —          | 25         | —          | uA   |
| C     | f=1MHZ                        | VR=1V    | —          | 430        | —          | pF   |
|       |                               | VR=200V  | —          | 54         | —          | pF   |
|       |                               | VR=400V  | —          | 39         | —          | pF   |
| $Q_C$ | VR=400V, IF=8A, di/dt=200A/μS |          | —          | 21         | —          | nC   |

## Electrical Characteristic Curves

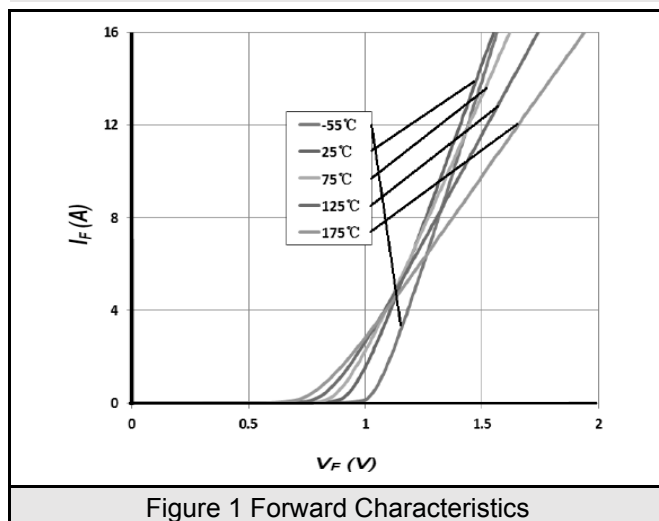


Figure 1 Forward Characteristics

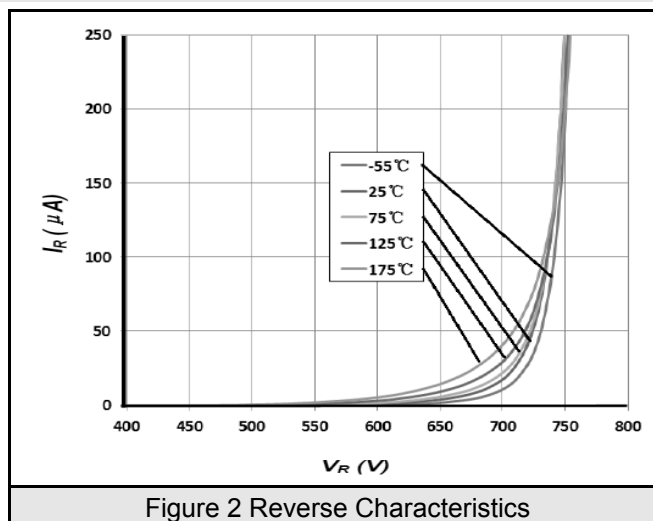


Figure 2 Reverse Characteristics

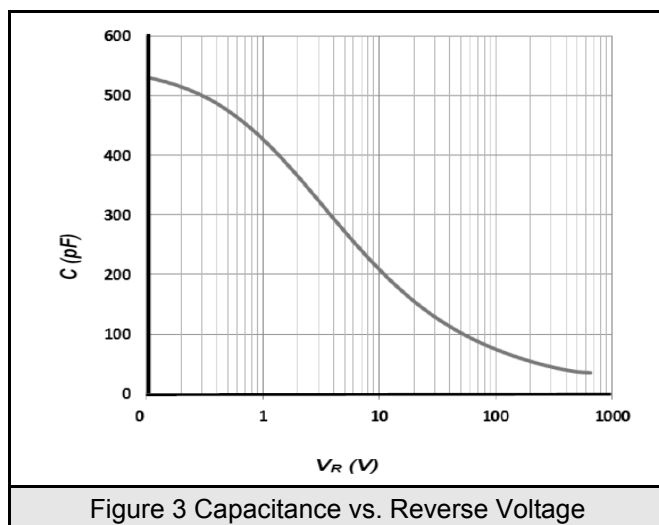


Figure 3 Capacitance vs. Reverse Voltage

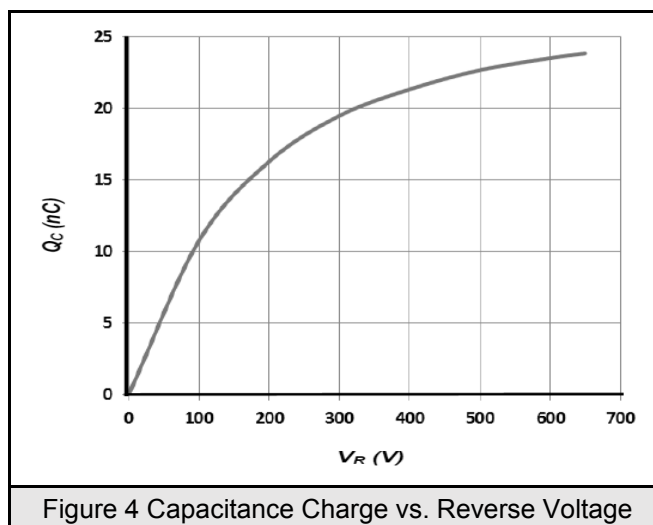
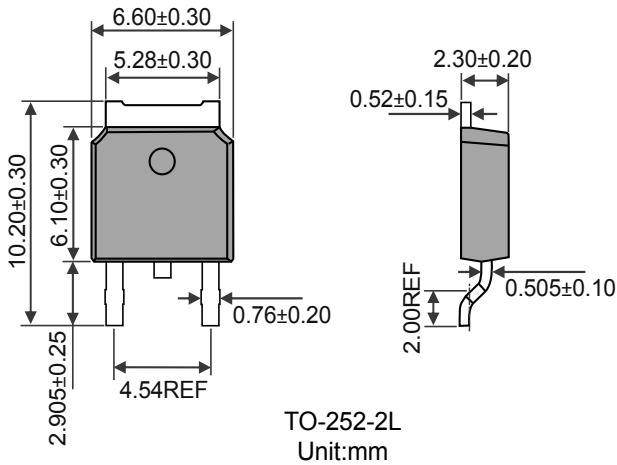


Figure 4 Capacitance Charge vs. Reverse Voltage

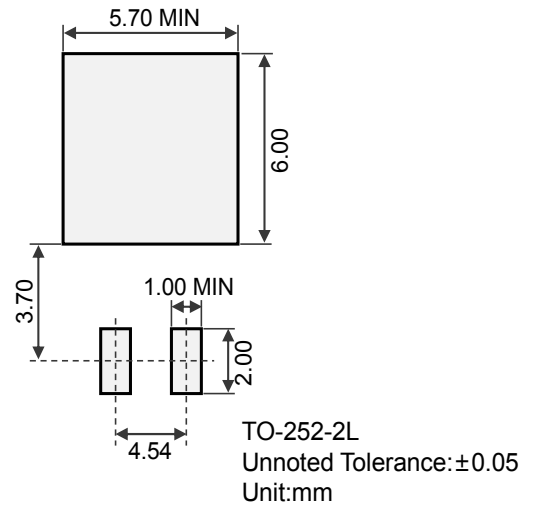


### Package Outline Dimensions & Suggested Solder Pad Layout

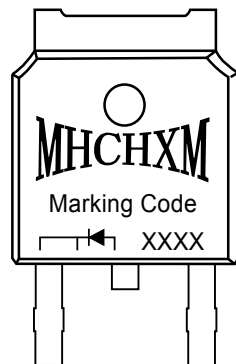
#### Package Outline Dimensions



#### Suggested Solder Pad Layout



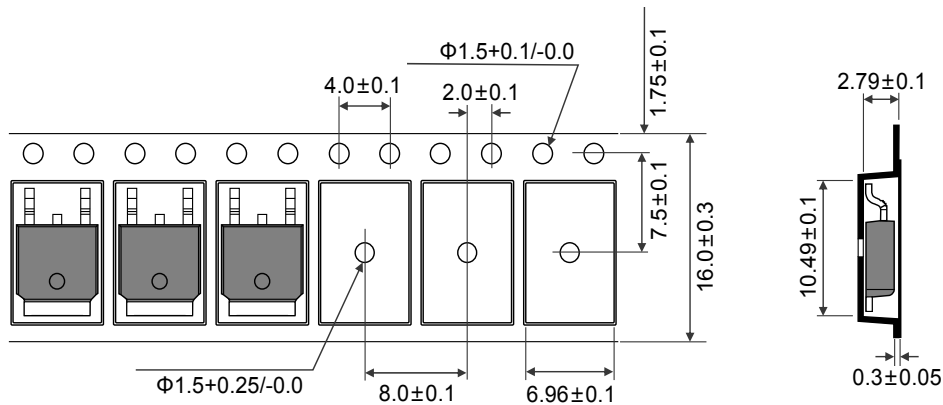
### Marking Information



“MHCHXM”= Product Logo  
“Marking Code”= The Following  
“XXXX”= Date Code Marking

| Marking Code | Part Number  |
|--------------|--------------|
| ECR865DCS    | ECR865DCS-HF |

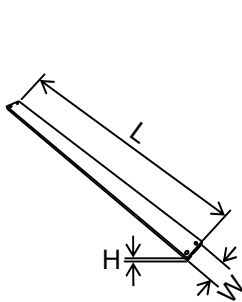
### Reel Tape Dimensions



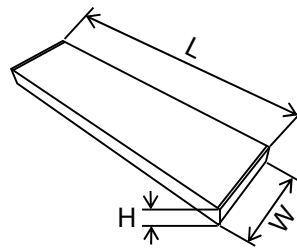
## Packing Information

| Packaging | Part Number | Quantity(pcs) | Size(mm)       |
|-----------|-------------|---------------|----------------|
| Tube      | Tube        | 80            | L540×W20×H5    |
|           | Inner Box   | 4000          | L570×W115×H55  |
|           | Outer Box   | 20000         | L595×W320×H135 |
| Reel      | Reel        | 3000          | Φ330×THK17     |
|           | Inner Box   | 3000          | L350×W340×H25  |
|           | Outer Box   | 30000         | L355×W300×H360 |

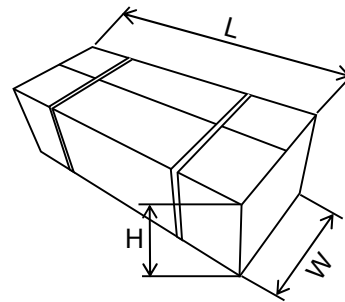
### Packaging:Tube



Tube

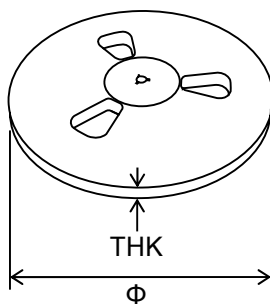


Tube Inner Box

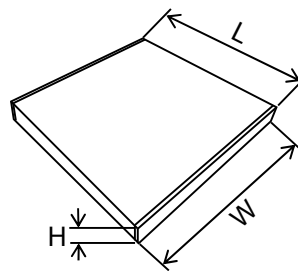


Tube Outer Box

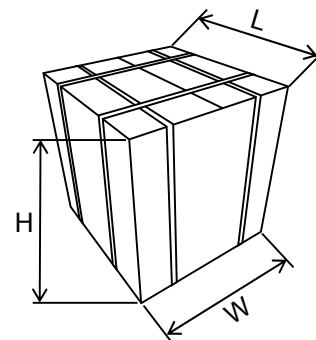
### Packaging:Reel



Reel



Reel Inner Box



Reel Outer Box



### Notes

#### Lead Forming

1. During lead frame bending, the lead frame should be bent at a distance more than 3mm from bottom of the epoxy. And the bending degree should not exceed 90°.

Note: The lead frame must be secured and do not touch the epoxy before bending to avoid damage to the transistor. In addition, when using a mold for a large number of lead molding, the structure of the fixed lead must be set, and it should be noted that the lead pressure rod structure cannot exert pressure on the epoxy resin body.

2. Do not bend the lead repeatedly. Do not bend the lead outward

#### Heat sink mounting

For power devices, in order to reduce junction temperature, heat dissipation blocks are usually used to disperse heat to the outside, and semiconductor power devices installed on the heat dissipation blocks can effectively dissipate heat without losing the reliability of the semiconductor, so the following matters should be noted when using:

1. Pay attention to the selection of silicone cream

In order to improve the thermal conductivity and heat dissipation effect of the device and the heat dissipation block, generally apply a thin layer of silicone grease evenly on the contact surface of the device and the heat dissipation block. Choose a silicone grease with low oil separation degree. Do not overapply it, otherwise it will attach too much stress to the resin.

2. Optimum torque is required

When using the fastening torque, pay attention not to use too much torque, so as not to damage the epoxy resin body, pay attention to the smooth cooling block body, no file chips and other foreign bodies between the transistor and the cooling block, pay attention to the selection of screws, nuts, gaskets and washers, so as not to cause damage to the transistor due to improper selection.

#### Soldering

1. Pay special attention to welding. When welding, the distance between the solder joint and the epoxy ball should be greater than 3mm, and it is recommended to weld it outside the tie rod base.

2. Avoid applying any pressure to the lead frame while the transistor is at high temperatures, especially when welding. Dip welding and manual welding should not be done more than once

#### Notes:

For specific precautions, please refer to our company's relevant technical documents or visit our official website at <http://www.jshxm.com>



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