

$V_{CES}$	600V
$I_C$ (Nominal)	30A
$V_{CE(sat)}$ (Typ.)	1.4V
Max. Possible Chips per Wafer	1931pcs

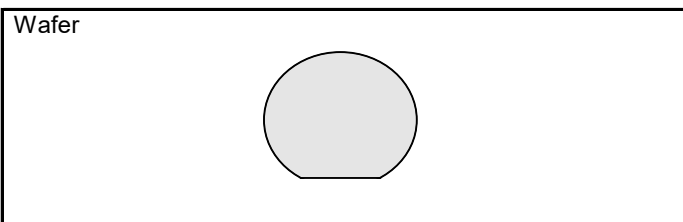
### ●Features

- 1) Trench Light Punch Through Type
- 2) Low Collector - Emitter Saturation Voltage
- 3) Soft Switching

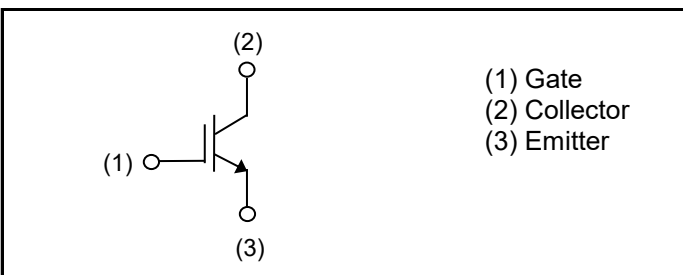
### ●Application

Partial Switching PFC  
Discharge Circuit  
Brake for Inverter

### ●Outline



### ●Inner Circuit



### ●Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Collector - Emitter Voltage, $T_j = 25^\circ\text{C}$	$V_{CES}$	600	V
Gate - Emitter Voltage	$V_{GES}$	$\pm 30$	V
Collector Current	$I_C^{*1}$	$^{*1)}$	A
Pulsed Collector Current	$I_{CP}^{*2}$	120	A
Operating Junction Temperature	$T_j$	-40 to +175	$^\circ\text{C}$

\*1 Depending on thermal properties of assembly

\*2 Pulse width limited by  $T_{jmax}$ .

### ●Design Assurance

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Reverse Bias Safe Operating Area	RBSOA <sup>*3</sup>	$I_C = 120A, V_{CC} = 480V,$ $V_P = 600V, V_{GE} = 15V,$ $R_G = 60\Omega, T_j = 175^\circ C$	FULL SQUARE			-

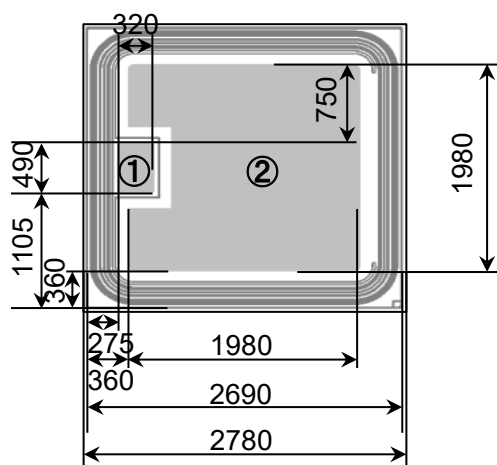
<sup>\*3</sup> Design assurance without measurement

### ●Electrical Characteristics (at $T_j = 25^\circ C$ unless otherwise specified, in case of TO-247N package)


Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Collector - Emitter Breakdown Voltage	$BV_{CES}$	$I_C = 10\mu A, V_{GE} = 0V$	600	-	-	V
Collector Cut - off Current	$I_{CES}$	$V_{CE} = 600V, V_{GE} = 0V$	-	-	10	$\mu A$
Gate - Emitter Leakage Current	$I_{GES}$	$V_{GE} = \pm 30V, V_{CE} = 0V$	-	-	$\pm 200$	nA
Gate - Emitter Threshold Voltage	$V_{GE(th)}$	$V_{CE} = 5V, I_C = 18.9mA$	4.5	5.5	6.5	V
Collector - Emitter Saturation Voltage	$V_{CE(sat)}^{*3}$	$I_C = 30A, V_{GE} = 15V,$ $T_j = 25^\circ C$	-	1.4	1.8	V
		$T_j = 175^\circ C$	-	1.6	-	
Input Capacitance	$C_{ies}$	$V_{CE} = 30V,$	-	1600	-	pF
Output Capacitance	$C_{oes}$	$V_{GE} = 0V,$	-	38	-	
Reverse transfer Capacitance	$C_{res}$	$f = 1MHz$	-	29	-	
Total Gate Charge	$Q_g$	$V_{CE} = 300V,$	-	68	-	nC
Gate - Emitter Charge	$Q_{ge}$	$I_C = 30A,$	-	13	-	
Gate - Collector Charge	$Q_{gc}$	$V_{GE} = 15V$	-	27	-	

<sup>\*3</sup> Design assurance without measurement

### ●Chip Information



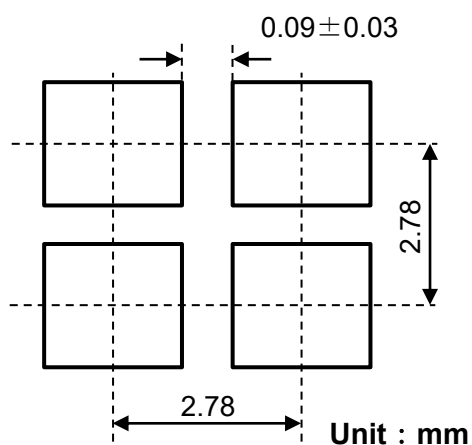
Unit :  $\mu\text{m}$

 : Pad Area

① : Gate Bonding Pad

② : Emitter Bonding Pad

Backside : Collector



Unit : mm

Wafer Size	150mm
Wafer Thickness	0.08 $\pm$ 0.01mm
Chip Size	2.78mm $\times$ 2.78mm
Cut Line Width	0.09 $\pm$ 0.03mm
Top Side Metallization	AlSiCu:4.4 $\mu\text{m}$
Back Side Metallization	Ti/Ni:0.4 $\mu\text{m}$ /Au:0.05 $\mu\text{m}$
Passivation	Polyimide

### ●Further Electrical Characteristics

Switching characteristics and thermal properties are depending strongly on module design and mounting technology and can therefore not be specified for a bare die.

This chip data sheet refers to the device data sheet	RGCL60TS60
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(Note1) Medical Equipment Classification of the Specific Applications

JAPAN	USA	EU	CHINA
CLASS III	CLASS III	CLASS II b	CLASS III
CLASS IV		CLASS III	

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  - Use of our Products outdoors or in places where the Products are exposed to direct sunlight or dust
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  - Use of our Products in places where the Products are exposed to static electricity or electromagnetic waves
  - Use of our Products in proximity to heat-producing components, plastic cords, or other flammable items
  - Sealing or coating our Products with resin or other coating materials
  - Use of our Products without cleaning residue of flux (Exclude cases where no-clean type fluxes is used. However, recommend sufficiently about the residue.) ; or Washing our Products by using water or water-soluble cleaning agents for cleaning residue after soldering
  - Use of the Products in places subject to dew condensation
- The Products are not subject to radiation-proof design.
- Please verify and confirm characteristics of the final or mounted products in using the Products.
- In particular, if a transient load (a large amount of load applied in a short period of time, such as pulse, is applied, confirmation of performance characteristics after on-board mounting is strongly recommended. Avoid applying power exceeding normal rated power; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.
- De-rate Power Dissipation depending on ambient temperature. When used in sealed area, confirm that it is the use in the range that does not exceed the maximum junction temperature.
- Confirm that operation temperature is within the specified range described in the product specification.
- ROHM shall not be in any way responsible or liable for failure induced under deviant condition from what is defined in this document.

## Precaution for Mounting / Circuit board design

- When a highly active halogenous (chlorine, bromine, etc.) flux is used, the residue of flux may negatively affect product performance and reliability.
- In principle, the reflow soldering method must be used on a surface-mount products, the flow soldering method must be used on a through hole mount products. If the flow soldering method is preferred on a surface-mount products, please consult with the ROHM representative in advance.

For details, please refer to ROHM Mounting specification

## Precautions Regarding Application Examples and External Circuits

1. If change is made to the constant of an external circuit, please allow a sufficient margin considering variations of the characteristics of the Products and external components, including transient characteristics, as well as static characteristics.
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## Precaution for Electrostatic

This Product is electrostatic sensitive product, which may be damaged due to electrostatic discharge. Please take proper caution in your manufacturing process and storage so that voltage exceeding the Products maximum rating will not be applied to Products. Please take special care under dry condition (e.g. Grounding of human body / equipment / solder iron, isolation from charged objects, setting of ionizer, friction prevention and temperature / humidity control).

## Precaution for Storage / Transportation

1. Product performance and soldered connections may deteriorate if the Products are stored in the places where:
  - [a] the Products are exposed to sea winds or corrosive gases, including Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, and NO<sub>2</sub>
  - [b] the temperature or humidity exceeds those recommended by ROHM
  - [c] the Products are exposed to direct sunshine or condensation
  - [d] the Products are exposed to high Electrostatic
2. Even under ROHM recommended storage condition, solderability of products out of recommended storage time period may be degraded. It is strongly recommended to confirm solderability before using Products of which storage time is exceeding the recommended storage time period.
3. Store / transport cartons in the correct direction, which is indicated on a carton with a symbol. Otherwise bent leads may occur due to excessive stress applied when dropping of a carton.
4. Use Products within the specified time after opening a humidity barrier bag. Baking is required before using Products of which storage time is exceeding the recommended storage time period.

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A two-dimensional barcode printed on ROHM Products label is for ROHM's internal use only.

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