

$V_{CES}$	650V
$I_C$ (Nominal)	40A
$V_{CE(sat)}$ (Typ.)	1.65V
Max. Possible Chips per Wafer	680pcs

### ●Features

- 1) Trench Light Punch Through Type
- 2) Low Collector - Emitter Saturation Voltage
- 3) Short Circuit Withstand Time  $8\mu s$

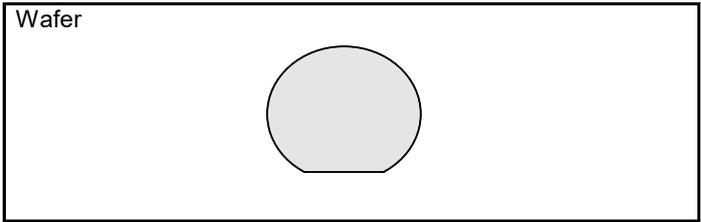
### ●Application

General Inverter

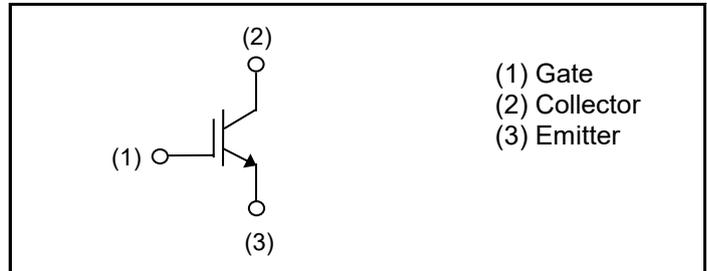
for Automotive and Industrial Use

Heater for Automotive

### ●Outline



### ●Inner Circuit



### ●Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Collector - Emitter Voltage, $T_j = 25^\circ C$	$V_{CES}$	650	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	$^\circ C$

\*1 Depending on thermal properties of assembly

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

### ●Design Assurance

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Short Circuit Withstand Time	$t_{sc}^{*3}$	$V_{CC} \leq 360V,$ $V_{GE} = 15V,$ $T_j = 25^\circ C$	8	-	-	$\mu s$
Short Circuit Withstand Time	$t_{sc}^{*3}$	$V_{CC} \leq 360V,$ $V_{GE} = 15V,$ $T_j = 150^\circ C$	6	-	-	$\mu s$
Reverse Bias Safe Operating Area	RBSOA <sup>*3</sup>	$I_C = 120A, V_{CC} = 520V,$ $V_P = 650V, V_{GE} = 15V,$ $R_G = 50\Omega, T_j = 175^\circ C$	FULL SQUARE			-

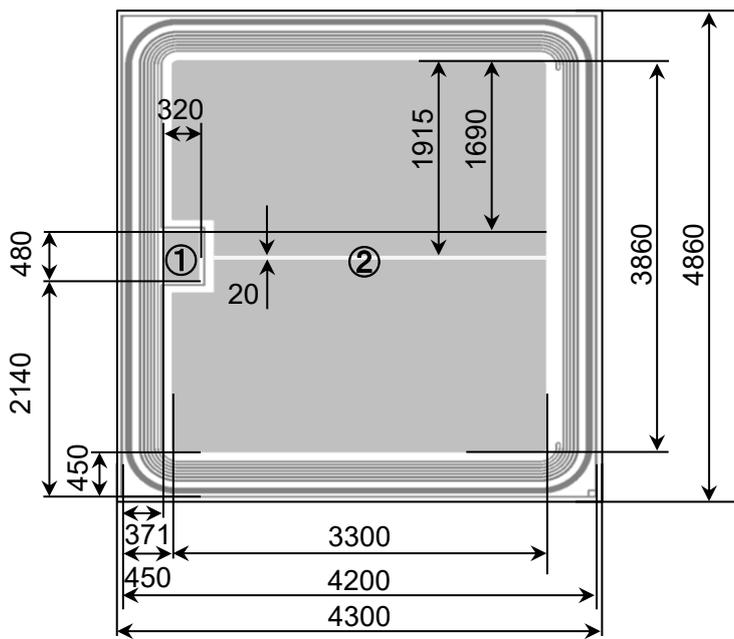
\*3 Design assurance without measurement

### ●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	$BV_{CES}$	$I_C = 10\mu A, V_{GE} = 0V$	650	-	-	V
Collector Cut - off Current	$I_{CES}$	$V_{CE} = 650V, V_{GE} = 0V$	-	-	10	$\mu A$
Gate - Emitter Leakage Current	$I_{GES}$	$V_{GE} = \pm 30V, V_{CE} = 0V$	-	-	$\pm 200$	nA
Gate - Emitter Threshold Voltage	$V_{GE(th)}$	$V_{CE} = 5V, I_C = 2.0mA$	5.0	6.0	7.0	V
Collector - Emitter Saturation Voltage	$V_{CE(sat)}^{*3}$	$I_C = 40A, V_{GE} = 15V,$ $T_j = 25^\circ C$ $T_j = 175^\circ C$	-	1.65	2.1	V
Input Capacitance	$C_{ies}$	$V_{CE} = 30V,$	-	1240	-	pF
Output Capacitance	$C_{oes}$	$V_{GE} = 0V,$	-	103	-	
Reverse transfer Capacitance	$C_{res}$	$f = 1MHz$	-	16	-	
Total Gate Charge	$Q_g$	$V_{CE} = 300V,$	-	48	-	nC
Gate - Emitter Charge	$Q_{ge}$	$I_C = 40A,$	-	12	-	
Gate - Collector Charge	$Q_{gc}$	$V_{GE} = 15V$	-	19	-	

\*3 Design assurance without measurement

●Chip Information



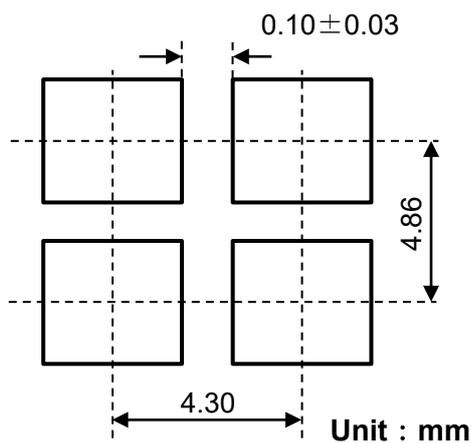
Unit : μm

▭ : Pad Area

① : Gate Bonding Pad

② : Emitter Bonding Pad

Backside : Collector



Wafer Size	150mm
Wafer Thickness	0.08±0.01mm
Chip Size	4.30mm×4.86mm
Cut Line Width	0.10±0.03mm
Top Side Metallization	AlSiCu:4.4μm
Back Side Metallization	Ti/Ni:0.4μm/Au:0.05μm
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	RGS80TS65
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