

V_{CES}	650V
I_C (Nominal)	20A
$V_{CE(sat)}$ (Typ.)	1.65V
Max. Possible Chips per Wafer	1158pcs

●Features

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

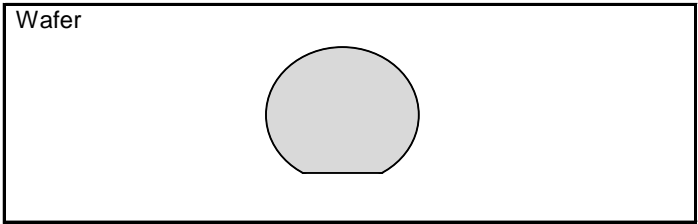
●Application

General Inverter

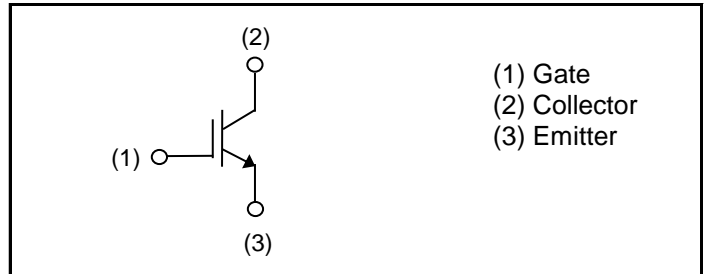
for Automotive and Industrial Use

Heater for Automotive

●Outline



●Inner Circuit



●Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Collector - Emitter Voltage, $T_j = 25^\circ\text{C}$	V_{CES}	650	V
Gate - Emitter Voltage	V_{GES}	± 30	V
Collector Current	I_C^{*1}	*1)	A
Pulsed Collector Current	I_{CP}^{*2}	60	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.	
Short Circuit Withstand Time	t_{sc}^{*3}	$V_{CC} \leq 360V,$ $V_{GE} = 15V,$ $T_j = 25^\circ C$	8	-	-	μs
Short Circuit Withstand Time	t_{sc}^{*3}	$V_{CC} \leq 360V,$ $V_{GE} = 15V,$ $T_j = 150^\circ C$	6	-	-	μs
Reverse Bias Safe Operating Area	RBSOA ^{*3}	$I_C = 60A, V_{CC} = 520V,$ $V_P = 650V, V_{GE} = 15V,$ $R_G = 50\Omega, T_j = 175^\circ C$	FULL SQUARE			-

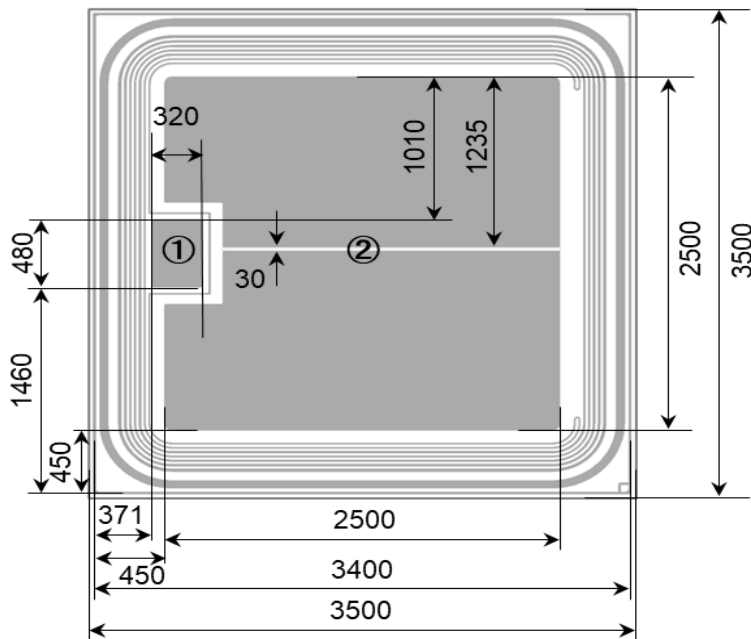
*3 Design assurance without measurement

●Electrical Characteristics (at $T_j = 25^\circ C$ unless otherwise specified, in case of TO-263L 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	μA
Gate - Emitter Leakage Current	I_{GES}	$V_{GE} = \pm 30V, V_{CE} = 0V$	-	-	± 200	nA
Gate - Emitter Threshold Voltage	$V_{GE(th)}$	$V_{CE} = 5V, I_C = 1.0mA$	5.0	6.0	7.0	V
Collector - Emitter Saturation Voltage	$V_{CE(sat)}^{*3}$	$I_C = 20A, V_{GE} = 15V,$ $T_j = 25^\circ C$ $T_j = 175^\circ C$	-	1.65 2.15	2.1 -	V
Input Capacitance	C_{ies}	$V_{CE} = 30V,$	-	881	-	pF
Output Capacitance	C_{oes}	$V_{GE} = 0V,$	-	55	-	
Reverse transfer Capacitance	C_{res}	$f = 1MHz$	-	7	-	
Total Gate Charge	Q_g	$V_{CE} = 400V,$	-	28	-	nC
Gate - Emitter Charge	Q_{ge}	$I_C = 20A,$	-	7	-	
Gate - Collector Charge	Q_{gc}	$V_{GE} = 15V$	-	11	-	

*3 Design assurance without measurement

●Chip Information



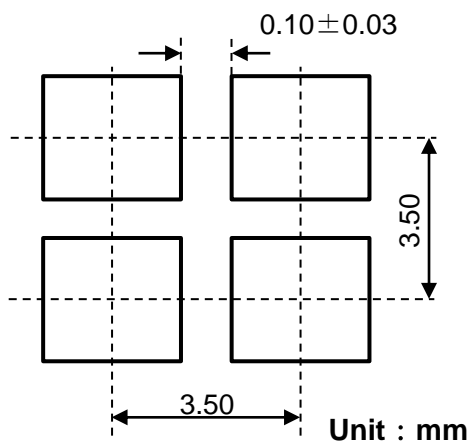
Unit : μm

: Pad Area

① : Gate Bonding Pad

② : Emitter Bonding Pad

Backside : Collector



Wafer Size	150mm
Wafer Thickness	0.08±0.01mm
Chip Size	3.50mm×3.50mm
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	RGS40NL65
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