

V_{CES}	1200V
I_C (Nominal)	10A
$V_{CE(sat)}$ (Typ.)	1.55V
Max. Possible Chips per Wafer	1700pcs

●Features

- 1) Trench Light Punch Through Type
- 2) Low Collector - Emitter Saturation Voltage
- 3) Short Circuit Withstand Time 10 μ s

●Application

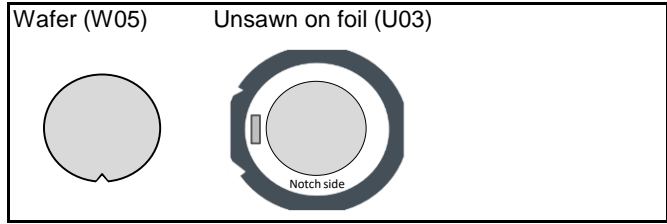
General Inverter

for Automotive and Industrial Use

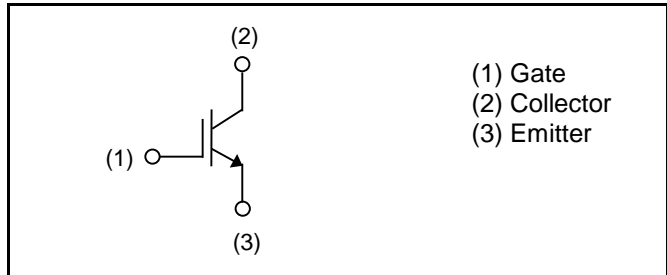
Heater for Automotive

Exciter for Automotive

●Outline



●Inner Circuit



●Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Collector - Emitter Voltage, $T_j = 25^\circ\text{C}$	V_{CES}	1200	V
Gate - Emitter Voltage	V_{GES}	± 30	V
Collector Current	I_C^{*1}	$^{*1)}$	A
Pulsed Collector Current	I_{CP}^{*2}	30	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}	$V_{GE} = 15V, T_j = 25^{\circ}C$	10	-	-	μs
		$V_{CC} \leq 800V$ $V_{CC} \leq 850V$	9	-	-	
Short Circuit Withstand Time	t_{sc}^{*3}	$V_{GE} = 15V, T_j = 150^{\circ}C$	8	-	-	μs
		$V_{CC} \leq 800V$ $V_{CC} \leq 850V$	7	-	-	
Reverse Bias Safe Operating Area	$RBSOA^{*3}$	$I_C = 30A, V_{CC} = 940V,$ $V_P = 1200V, V_{GE} = 15V,$ $R_G = 50\Omega, T_j = 175^{\circ}C$	FULL SQUARE			-

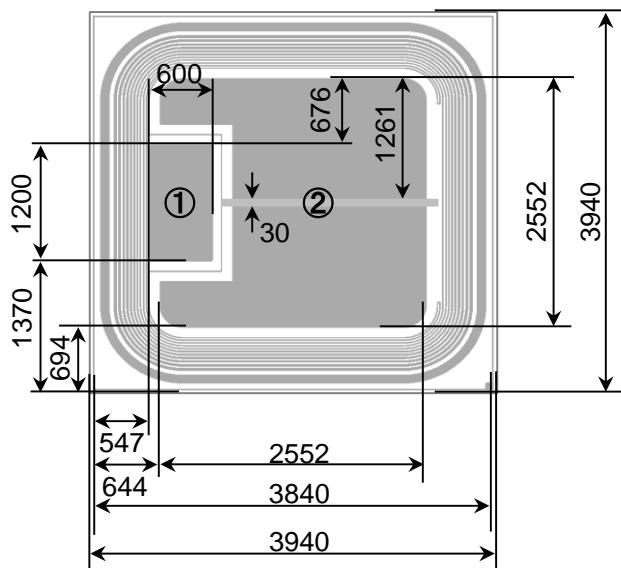
*3 Design assurance without measurement

●Electrical Characteristics (at $T_j = 25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Collector - Emitter Breakdown Voltage	BV_{CES}	$I_C = 10\mu A, V_{GE} = 0V$	1200	-	-	V
Collector Cut - off Current	I_{CES}	$V_{CE} = 1200V, V_{GE} = 0V$	-	-	10	μA
Gate - Emitter Leakage Current	I_{GES}	$V_{GE} = \pm 30V, V_{CE} = 0V$	-	-	± 500	nA
Gate - Emitter Threshold Voltage	$V_{GE(th)}$	$V_{CE} = 5V, I_C = 1.2mA$	5.5	6.3	7.1	V
Collector - Emitter Saturation Voltage	$V_{CE(sat)}^{*3}$	$I_C = 10A, V_{GE} = 15V,$ $T_j = 25^{\circ}C$	-	1.55	1.95	V
		$T_j = 150^{\circ}C$	-	1.95	-	
Input Capacitance	C_{ies}	$V_{CE} = 30V,$	-	1863	-	pF
Output Capacitance	C_{oes}	$V_{GE} = 0V,$	-	44	-	
Reverse transfer Capacitance	C_{res}	$f = 1MHz$	-	14	-	
Total Gate Charge	Q_g	$V_{CE} = 600V,$	-	67	-	nC
Gate - Emitter Charge	Q_{ge}	$I_C = 10A,$	-	15	-	
Gate - Collector Charge	Q_{gc}	$V_{GE} = 15V$	-	31	-	
Gate Input Resistance	$R_{G(int)}$	$f = 1MHz, \text{open collector}$	-	3.1	-	Ω
Integrated Gate Resistor	R_G	$f = 1MHz, \text{open collector}$	-	None	-	Ω

*3 Design assurance without measurement

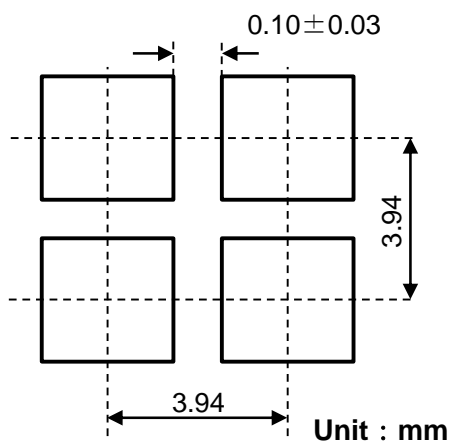
●Chip Information



Unit : μm

- : Pad Area
- ① : Gate Bonding Pad
- ② : Emitter Bonding Pad

Backside : Collector



Wafer Size	200mm
Wafer Thickness	0.13±0.01mm
Chip Size	3.94mm×3.94mm
Cut Line Width	0.10±0.03mm
Top Side Metallization	AlCu:4.4μm
Back Side Metallization	Ti/Ni:0.4μm/Au:0.05μm
Passivation	Polyimide
Active Area Total	6.59mm ²

●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	-
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Technology planning to qualify in TO-247-4L package.

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