

# 2PG009

## Silicon N-channel enhancement IGBT

For plasma display panel drive  
 For high speed switching circuits

**■ Features**

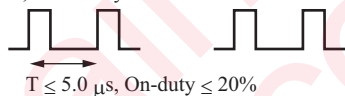
- Low collector-emitter saturation voltage:  $V_{CE(sat)} < 2.5\text{ V}$
- High-speed switching:  $t_f = 185\text{ ns}$  (typ.)

**■ Absolute Maximum Ratings**  $T_C = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Collector-emitter voltage (E-B short)	$V_{CES}$	510	V
Gate-emitter voltage (E-B short)	$V_{GES}$	-30 to +35	V
Collector current	$I_C$	40	A
Peak collector current *	$I_{CP}$	230	A
Power dissipation	$P_C$	40	W
		$T_a = 25^\circ\text{C}$ 2.0	W
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

Note) \*: Assurance of repetitive pulse. (Repetitive period  $\leq 5\ \mu\text{s}$  on-duty  $\leq 20\%$ )

But, it must stay within 40% of all that the time impressed pulse repetitively.



**■ Electrical Characteristics**  $T_C = 25^\circ\text{C} \pm 3^\circ\text{C}$

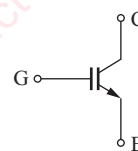
Parameter	Symbol	Conditions	Min	Typ	Max	Unit	
Collector-emitter voltage (E-B short)	$V_{CES}$	$I_C = 1\text{ mA}$ , $V_{GE} = 0$	510			V	
Collector-emitter cutoff current (E-B short) *	$I_{CES}$	$V_{CE} = 408\text{ V}$ , $V_{GE} = 0$			5.0	$\mu\text{A}$	
Gate-emitter cutoff current (E-B short)	$I_{GES}$	$V_{GE} = \pm 35\text{ V}$ , $-30\text{ V}$ , $V_{CE} = 0$			$\pm 1.0$	$\mu\text{A}$	
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = 10\text{ V}$ , $I_C = 1.0\text{ mA}$	3.0		5.5	V	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$V_{GE} = 15\text{ V}$ , $I_C = 40\text{ A}$		1.95	2.5	V	
Collector-emitter reverse break down voltage	$-V_{CE}$	$I_C = -100\text{ mA}$ , $V_{GE} = 15\text{ V}$	18	22.5		V	
Short-circuit input capacitance (Common emitter)	$C_{ies}$	$V_{CE} = 25\text{ V}$ , $V_{GE} = 0$ , $f = 1\text{ MHz}$		1 210		pF	
Short-circuit output capacitance (Common emitter)	$C_{oes}$				125		pF
Reverse transfer capacitance (Common emitter)	$C_{res}$				21		pF
Gate charge load	$Q_g$	$V_{CC} = 250\text{ V}$ , $I_C = 40\text{ A}$ , $V_{GE} = 15\text{ V}$		51		nC	
Gate-emitter charge	$Q_{ge}$				9		nC
Gate-collector charge	$Q_{gc}$				20		nC
Turn-on delay time	$t_{d(on)}$	$V_{CC} = 250\text{ V}$ , $I_C = 40\text{ A}$ , $RL \approx 6.25\ \Omega$ , $V_{GE} = 15\text{ V}$		75		ns	
Rise time	$t_r$				610		ns
Turn-off delay time	$t_{d(off)}$				200		ns
Fall time	$t_f$				185	300	ns
Thermal resistance (ch-c)	$R_{th(ch-c)}$				3.13	$^\circ\text{C/W}$	
Thermal resistance (ch-a)	$R_{th(j-a)}$				63	$^\circ\text{C/W}$	

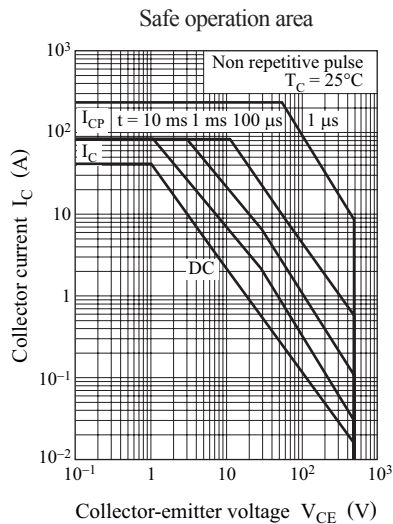
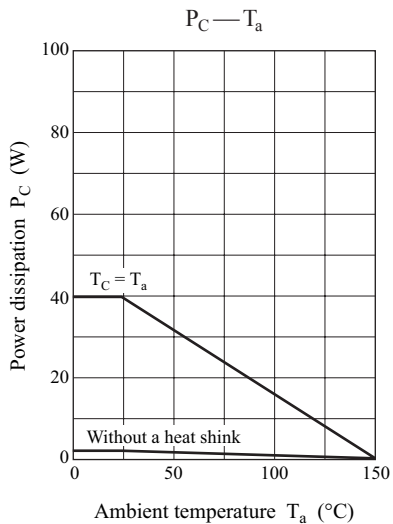
Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

**■ Package**

- Code  
TO-220D-A1
- Marking Symbol: 2PG009
- Pin Name
  1. Gate
  2. Collector
  3. Emitter

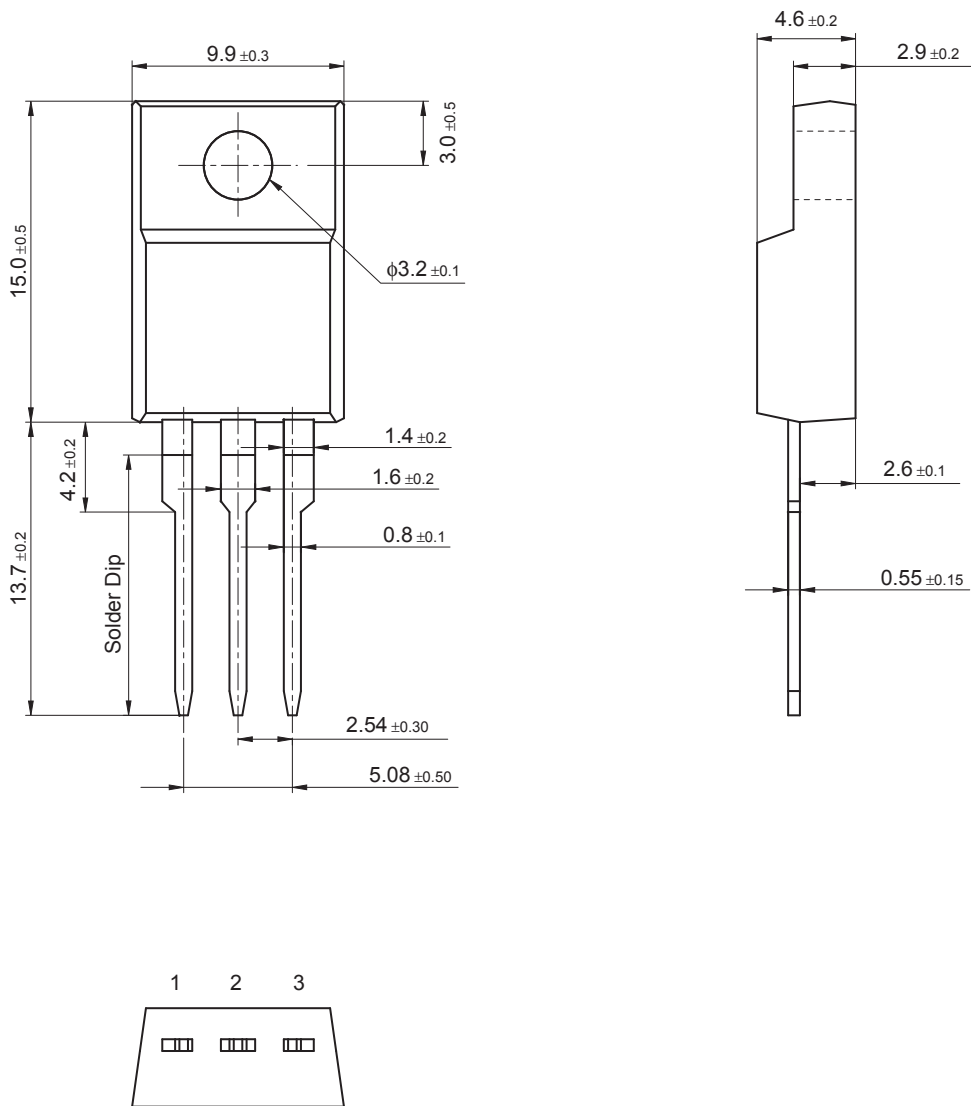
**■ Internal Connection**





TO-220D-A1

Unit: mm



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