

Product Preview

SMARTDISCRETES™

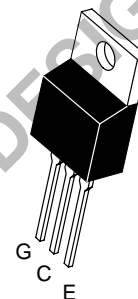
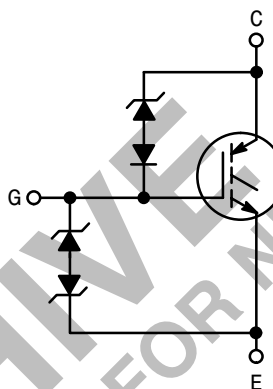
Internally Clamped, N-Channel IGBT

This Logic Level Insulated Gate Bipolar Transistor (IGBT) features Gate–Emitter ESD protection, Gate–Collector overvoltage protection from SMARTDISCRETES™ monolithic circuitry for usage as an **Ignition Coil Driver**.

- Temperature Compensated Gate–Collector Clamp Limits Stress Applied to Load
- Integrated ESD Diode Protection
- Low Threshold Voltage to Interface Power Loads to Logic or Microprocessors
- Low Saturation Voltage
- High Pulsed Current Capability

MGP20N14CL

**20 AMPERES
VOLTAGE CLAMPED
N-CHANNEL IGBT
V_{CE(on)} = 1.9 VOLTS
135 VOLTS (CLAMPED)**



**CASE 221A-09
STYLE 9
TO-220AB**

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V _{CES}	CLAMPED	Vdc
Collector–Gate Voltage	V _{CGR}	CLAMPED	Vdc
Gate–Emitter Voltage	V _{GE}	CLAMPED	Vdc
Collector Current — Continuous	I _C	20	Adc
— Single Pulsed (t _p = ± 10 μs)	I _{CM}	60	Apk
Total Power Dissipation (TO-220) Derate Above 25°C	P _D	150 1.0	Watts W/°C
Operating and Storage Temperature Range	T _J , T _{stg}	-55 to 175	°C
Single Pulse Collector–Emitter Avalanche Energy @ Starting T _J = 25°C (V _{CC} = 80 V, V _{GE} = 5 V, Peak I _L = 10 A, L = 10 mH)	E _{AS}	500	mJ

THERMAL CHARACTERISTICS

Thermal Resistance — Junction to Case – (TO-220) — Junction to Ambient	R _{θJC} R _{θJA}	1.0 62.5	°C/W
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 5 seconds	T _L	260	°C
Mounting Torque, 6-32 or M3 screw	10 lbf•in (1.13 N•m)		

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This document contains information on a new product. Specifications and information herein are subject to change without notice.

MGP20N14CL

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Clamp Voltage ($I_{\text{Clamp}} = 10 \text{ mA}$, $T_J = -40$ to 150°C)	$V_{(\text{BR})\text{CES}}$	135			Vdc
Zero Gate Voltage Collector Current ($V_{\text{CE}} = 100 \text{ V}$, $V_{\text{GE}} = 0 \text{ V}$) ($V_{\text{CE}} = 100 \text{ V}$, $V_{\text{GE}} = 0 \text{ V}$, $T_J = 150^\circ\text{C}$)	I_{CES}	—	—	10 100	μA
Gate–Emitter Clamp Voltage ($I_G = 1 \text{ mA}$)	$V_{(\text{BR})\text{GES}}$	10			Vdc
Gate–Emitter Leakage Current ($V_{\text{GE}} = \pm 5 \text{ V}$, $V_{\text{CE}} = 0 \text{ V}$)	I_{GES}	—	—	1.0	μA

ON CHARACTERISTICS (1)

Gate Threshold Voltage ($V_{\text{CE}} = V_{\text{GE}}$, $I_C = 1 \text{ mA}$) Threshold Temperature Coefficient (Negative)	$V_{\text{GE}(\text{th})}$	1.0	1.5 4.4	2.0	V $\text{mV}/^\circ\text{C}$
Collector–Emitter On–Voltage ($V_{\text{GE}} = 5 \text{ V}$, $I_C = 10 \text{ A}$) ($V_{\text{GE}} = 5 \text{ V}$, $I_C = 10 \text{ Adc}$, $T_J = 175^\circ\text{C}$)	$V_{\text{CE}(\text{on})}$	—		1.9 1.8	V
Forward Transconductance ($V_{\text{CE}} > 15 \text{ V}$, $I_C = 10 \text{ A}$)	g_{fe}	8.0	15	—	Mhos

DYNAMIC CHARACTERISTICS

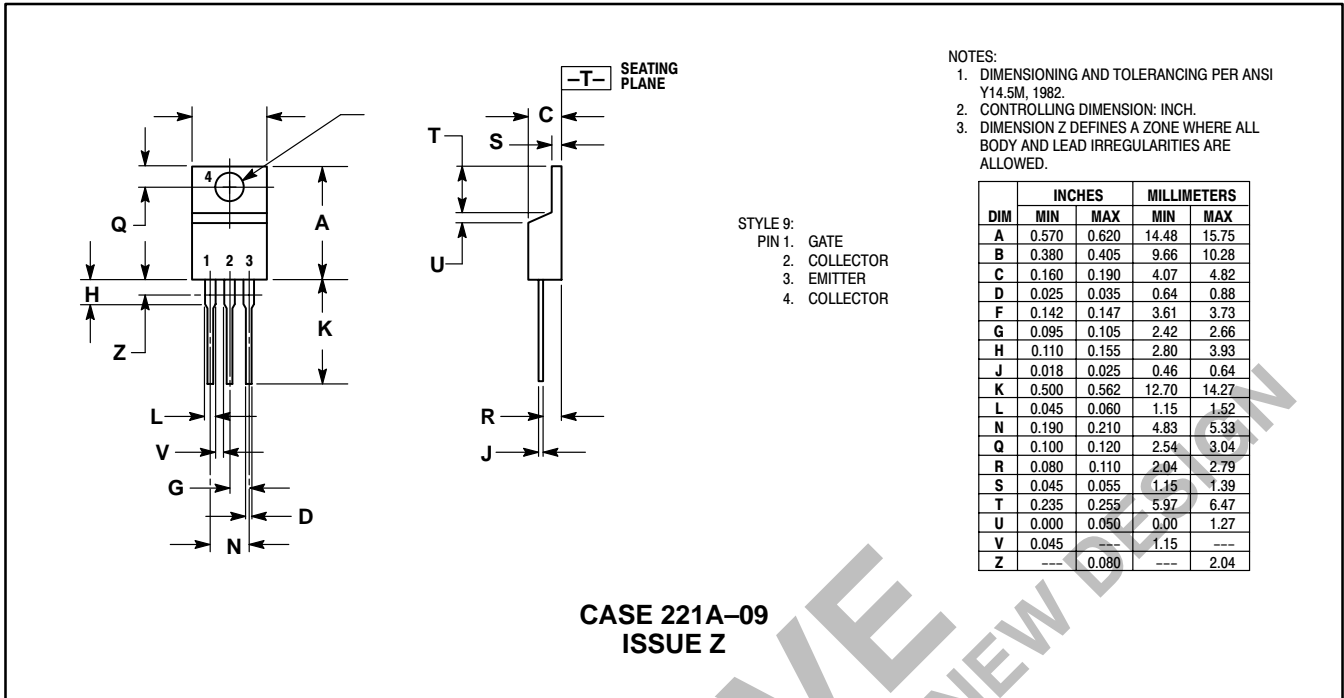
Input Capacitance	$(V_{\text{CE}} = 25 \text{ Vdc}$, $V_{\text{GE}} = 0 \text{ Vdc}$, $f = 1.0 \text{ MHz}$)	C_{ies}	—	430	600	pF
Output Capacitance		C_{oes}	—	182	250	
Transfer Capacitance		C_{res}	—	48	100	

SWITCHING CHARACTERISTICS (1)

Turn–On Delay Time	$(V_{\text{CC}} = 68 \text{ V}$, $I_C = 20 \text{ A}$, $V_{\text{GE}} = 5 \text{ V}$, $R_G = 9.1 \Omega$)	$t_{\text{d}(\text{on})}$	—	TBD	TBD	ns
Rise Time		t_r	—	TBD	TBD	
Turn–Off Delay Time		$t_{\text{d}(\text{off})}$	—	TBD	TBD	
Fall Time		t_f	—	TBD	TBD	
Total Gate Charge	$(V_{\text{CC}} = 108 \text{ V}$, $I_C = 20 \text{ A}$, $V_{\text{GE}} = 5 \text{ V}$)	Q_T	—	14	20	nC
Gate–Emitter Charge		Q_{ge}	—	3.0	—	
Gate–Collector Charge		Q_{gc}	—	6.0	—	


(1) Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2\%$.

PACKAGE DIMENSIONS



ARCHIVE
 DEVICE NOT RECOMMENDED FOR NEW DESIGN

ARCHIVE
RECOMMENDED FOR NEW DESIGN

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