CI20T120P

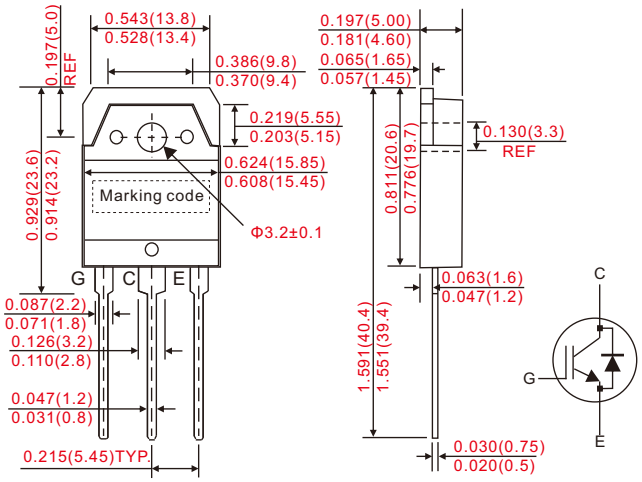
20A1200V Field Stop Trench IGBT

■ Features

- Positive temperature Co-efficient for easy parallel operation.
- High current capability.
- High input impedance.
- Suffix "G" indicates Halogen-free part, ex.CI20T120PG.

■ Outline

TO-3P



Dimensions in inches and (millimeters)

■ Mechanical data

- Epoxy : UL94-V0 rated flame retardant.
- Case : JEDEC TO-3P molded plastic body.
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026.
- Polarity: As marked.
- Mounting Position : Any.
- Weight : Approximated 5.60 gram.

■ Maximum ratings

Rating at 25°C ambient temperature unless otherwise specified. Single phase, half wave, 60Hz, resistive or inductive load. For capacitive load, derate current by 20%.

Parameter	Conditions	Symbol	CI20T120P	UNIT
Marking code			CI20T120P	
Collector to Emitter Voltage		V_{CE}	1200	V
Collector Current	T_C = 25°C T_C = 100°C	I_C	40 20	A
Pulsed collector current		I_{Cpuls}	60	A
RBSOA current	V_{CE} < 1200V, T_J < 150°C	I_{Cpeak}	60	A
Diode Forward Current	T_C = 25°C T_C = 100°C	I_F	30 20	A
Pulsed doide current		I_{Fpuls}	60	A
Gate to Emitter Voltage		V_{GE}	±20	V
Power dissipation	T_C = 25°C T_C = 100°C	P_{tot}	tbd tbd	W
Operating Junction Temperature		T_J	-55 ~ +150	°C
Storage Temperature Range		T_{STG}	-55 ~ +150	°C

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■ Thermal characteristics

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Thermal Resistance	Junction to Case	$R_{\theta JC}$			0.6	K/W
Diode thermal resistance	chip case	$R_{\theta JCD}$			3	
Thermal Resistance	Junction to Ambient	$R_{\theta JA}$			40	

■ Electrical characteristics(AT T_A=25°C unless otherwise noted)

On characteristivs

PARAMETER	CONDITIONS		Symbol	MIN.	TYP.	MAX.	UNIT
Collector to Emitter Breakdown Voltage	V_{GE} = 0V, I_C = 0.5mA		$V_{(BR)CES}$	1200			V
Collector to Emitter Saturation Voltage	V_{GE} = 15V, I_C = 15A	T_J = 25°C	$V_{CE(sat)}$		1.95	2.1	
		T_J = 150°C			2.2		
	V_{GE} = 15V, I_C = 20A	T_J = 25°C			2.1	2.3	
		T_J = 150°C			2.45		
Diode forward voltage	V_{GE} = 0V, I_F = 20A	T_J = 25°C	V_F		1.28		
		T_J = 150°C			1.27		
Gate threshold voltage	I_C = 0.75mA, V_{CE} = V_{GE}		$V_{GE(th)}$	5.0	6.0	7.0	
Collector Cut-Off Current	V_{CE} = 1200V, V_{GE} = 0V	T_J = 25°C	I_{CES}			100	uA
		T_J = 150°C				2000	
G-E Leakage Current	V_{CE} = 0V, V_{GE} = 20V		I_{GES}			100	nA
Transconductance	V_{CE} = 20V, I_C = 20A		gFS		14		S

Dynamic characteristivs

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Input Capacitance	V_{CE} = 25V	C_{iss}		3400		pF
Output Capacitance	V_{GE} = 0V	C_{oss}		100		
Reverse Transfer Capacitance	f = 1MHz	C_{rss}		54		
Total Gate Charge	V_{CC} = 900V, I_C = 20A, V_{GE} = 15V	Q_G		120		nC

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Switching characteristivs

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Turn-On Delay Time	T_J = 25°C	$t_{d(on)}$		44		ns
Rise Time	V_{CC} = 600V, I_C = 20A	t_r		50		
Turn-Off Delay Time	V_{GE} = 15/0V	$t_{d(off)}$		180		
Fall Time	R_G = 15Ω	t_f		150		
Turn-On Switching Loss	L_{load} = 500μH	E_{on}		1.1		mJ
Turn-Off Switching Loss		E_{off}		0.9		
Total Switching Loss		E_{ts}		2.0		
Turn-On Delay Time	T_J = 150°C	$t_{d(on)}$		40		ns
Rise Time	V_{CC} = 600V, I_C = 20A	t_r		45		
Turn-Off Delay Time	V_{GE} = 15/0V	$t_{d(off)}$		210		
Fall Time	R_G = 15Ω	t_f		245		
Turn-On Switching Loss	L_{load} = 500μH	E_{on}		1.2		mJ
Turn-Off Switching Loss		E_{off}		1.45		
Total Switching Loss		E_{ts}		2.65		

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