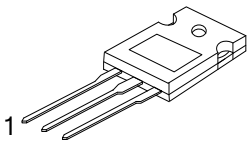
UPG20N120

Insulated Gate Bipolar Transistor

1200V NPT PLANAR IGBT



TO-247

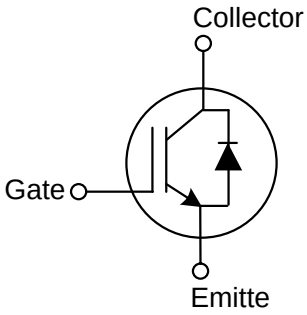
■ DESCRIPTION

The UTC **UPG20N120** is a 1200V NPT Planar Insulated Gate Bipolar Transistor. it uses UTC's advanced technology to offers superior conduction and switching performance, high avalanche ruggedness and easy parallel operation.

■ FEATURES

* High speed switching
* High input impedance
* Low saturation voltage: $V_{CE(SAT)}$ =2.6V @ I_C=20A

■ SYMBOL



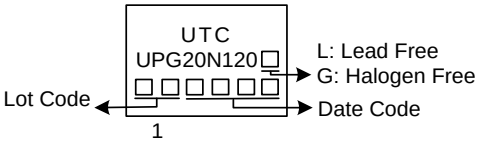
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UPG20N120L-T47-T	UPG20N120G-T47-T	TO-247	G	C	E	Tube

Note: Pin Assignment: G: Gate C: Collector E: Emitter

UPG20N120G-T47-T (1)Packing Type	(1) T: Tube
(2)Package Type	(2) T47: TO-247
(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage		V_{CES}	1200	V
Gate-Emitter Voltage		V_{GES}	±20	V
Continuous Collector Current	T_C=25°C	I_C	40	A
	T_C=100°C		20	A
Collector Current Pulsed (Note 1)		I_{CM}	80	A
Power Dissipation		P_D	300	W
Operating Junction Temperature		T_J	-55 ~ +150	°C
Storage Temperature Range		T_{STG}	-55 ~ +150	°C

Notes: 1. Absolute maximum ratings are stress ratings only and functional device operation is not implied. Absolute maximum ratings are those values beyond which the device could be permanently damaged.
2. Pulse width limited by maximum junction temperature.

■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Case	θ_{JC}	0.35	°C/W

■ ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Off Characteristics						
Collector-Emitter Breakdown Voltage	B_{VCES}	I_C=250μA, V_{GE}=0V	1200			V
Collector Cut-Off Current	I_{CES}	V_{CE}=V_{CES}, V_{GE}=0V			250	μA
G-E Leakage Current	I_{GES}	V_{GE}=V_{GES}, V_{CE}= 0V			±250	nA
On Characteristics						
Gate to Emitter Threshold Voltage	$V_{GE(TH)}$	I_C=90μA, V_{CE}=V_{GE}	4.0		6.0	V
Collector to Emitter Saturation Voltage	$V_{CE(SAT)}$	I_C=20A, V_{GE}=15V		2.15	2.6	V
Dynamic Characteristics						
Input Capacitance	C_{IES}	V_{CE}=25V, V_{GE}=0V, f=1MHz		1220		pF
Output Capacitance	C_{OES}			210		pF
Reverse Transfer Capacitance	C_{RES}			125		pF
Switching Characteristics						
Total Gate Charge	Q_G	V_{CE}=100V, V_{GE}=15V, I_C=20A		105		nC
Gate-Emitter Charge	Q_{GE}	V_{CE}=100V, V_{GE}=15V, I_C=20A		21		nC
Gate-Collector Charge	Q_{GC}			50		nC
Turn-On Delay Time	$t_{D(ON)}$	V_{CC}=50V, V_{GE}=15V, I_C=20A, R_G=10Ω,		50		ns
Rise Time	t_R			190		ns
Turn-Off Delay Time	$t_{D(OFF)}$			215		ns
Fall Time	t_F			81		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Forward Voltage Drop	V_{FM}	I_F=20A		2.4		V
Reverse Recovery Time	t_{rr}	I_F=20A, dI/dt=200A/μS		115		ns
Reverse Recovery Charge	Q_{rr}			360		nC

■ TYPICAL CHARACTERISTICS