



UPG20N120

Insulated Gate Bipolar Transistor

1200V NPT PLANAR IGBT

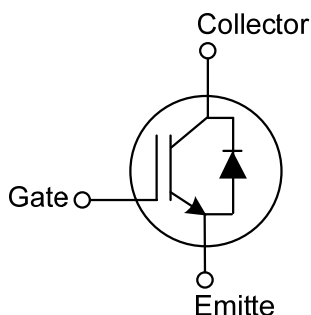
DESCRIPTION

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



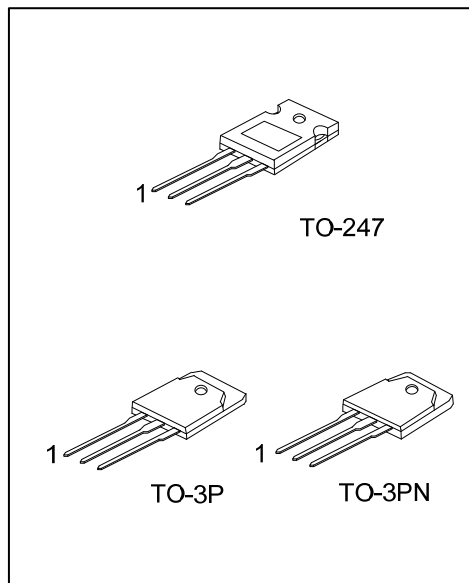
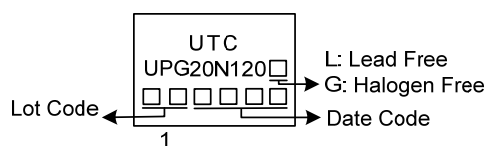
ORDERING INFORMATION

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
UPG20N120L-T3P-T	UPG20N120G-T3P-T	TO-3P	G	C	E	Tube
UPG20N120L-T3N-T	UPG20N120G-T3N-T	TO-3PN	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, T3P: TO-3P, T3N: TO-3PN
	(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	$T_C=25^{\circ}\text{C}$	I_C	40	A
	$T_C=100^{\circ}\text{C}$		20	A
Collector Current Pulsed (Note 1)		I_{CM}	80	A
Power Dissipation	TO-247	P_D	270	W
	TO-3P/TO-3PN		295	W
Operating Junction Temperature		T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature Range		T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$

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.

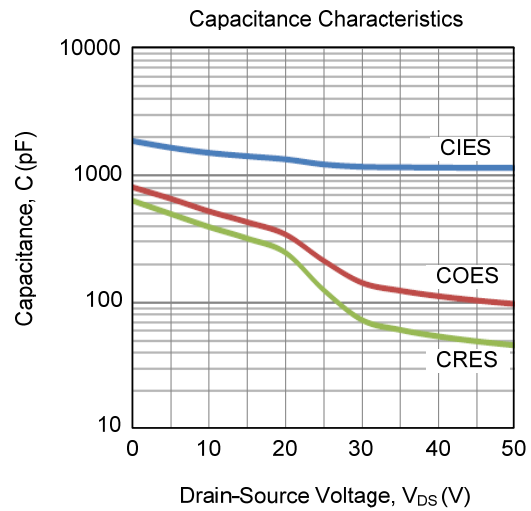
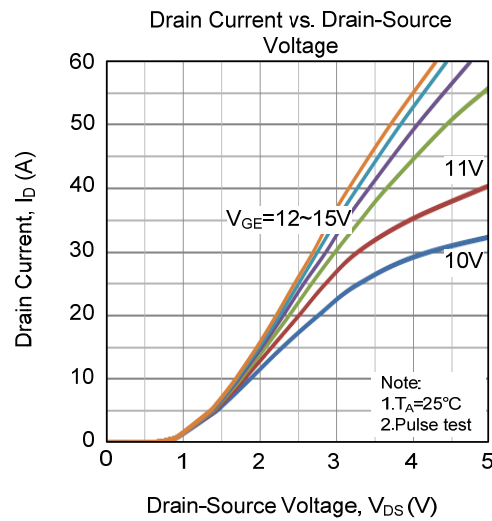
■ THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Case	TO-247	θ_{JC}	0.46	$^{\circ}\text{C/W}$
	TO-3P/TO-3PN		0.42	$^{\circ}\text{C/W}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Off Characteristics						
Collector-Emitter Breakdown Voltage	B _V CES	I _C =250μA, V _{GE} =0V	1200			V
Collector Cut-Off Current	I _C ES	V _{CE} =V _{CES} , V _{GE} =0V			250	μA
G-E Leakage Current	I _G ES	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 _I ES	V _{CE} =25V, V _{GE} =0V, f=1MHz		1220		pF
Output Capacitance	C _O ES			210		pF
Reverse Transfer Capacitance	C _R ES			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



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