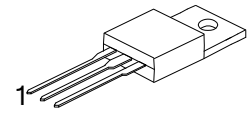
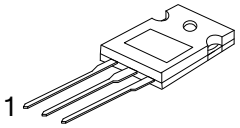
UG25N120

Preliminary ***Insulated Gate Bipolar Transistor***

1200V NPT TRENCH IGBT



TO-220



TO-247

■ DESCRIPTION

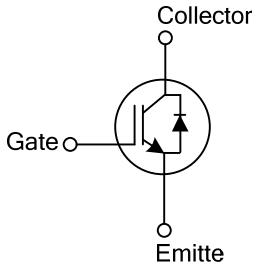
The UTC **UG25N120** is an NPT ignition Insulated Gate Bipolar Transistor. it uses UTC's advanced technology to provide customers with high switching speed, high avalanche ruggedness, low saturation voltage and low switching loss, etc.

The UTC **UG25N120** is suitable for the resonant or soft switching applications.

■ FEATURES

* High switching speed
* High avalanche ruggedness
* Low saturation voltage: $V_{CE(sat),\ typ}$ =2.0V @ I_C=25A and T_C =25°C
* Low switching loss: $E_{off,\ typ}$=0.96mJ @ I_C=25A and T_C=25°C

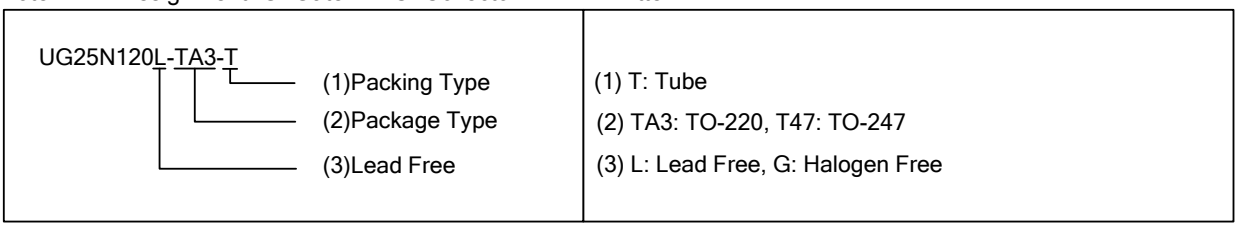
■ SYMBOL



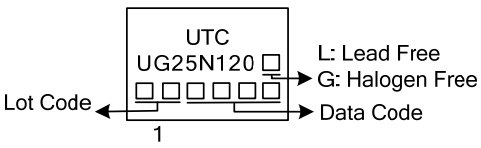
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UG25N120L-TA3-T	UG25N120G-TA3-T	TO-220	G	C	E	Tube
UG25N120L-T47-T	UG25N120G-T47-T	TO-247	G	C	E	Tube

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



■ 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	50	A
		T_C=100°C		25	A
Collector Current Pulsed (Note 1)			I_{CM}	75	A
Diode Continuous Forward Current (T_C=100°C)			I_F	25	A
Diode Maximum Forward Current			I_{FM}	150	A
Power Dissipation	T_C=25°C	TO-220	P_D	89	W
		TO-247		200	
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 Ambient	TO-220	θ_{JA}	62.5	°C/W
	TO-247		40	
Junction to Case	TO-220	θ_{JC}	1.4	°C/W
	TO-247		0.62	

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

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Off Characteristics							
Collector Cut-Off Current	I_{CES}	V_{CE}=V_{CES}, V_{GE}=0V				3	mA
G-E Leakage Current	I_{GES}	V_{GE}=V_{GES}, V_{CE}= 0V				±250	mA
On Characteristics							
Gate to Emitter Threshold Voltage	$V_{GE(TH)}$	I_C=25mA, V_{CE}=V_{GE}		3.5	5.5	7.5	V
Collector to Emitter Saturation Voltage	$V_{CE(SAT)}$	I_C=25A, V_{GE}=15V			2.0	2.5	V
		I_C=25A, V_{GE}=15V, T_C=125°C			2.15		V
		I_C=50A, V_{GE}=15V			2.65		V
Dynamic Characteristics							
Input Capacitance	C_{IES}	V_{CE}=30V, V_{GE}=0V, f=1MHz			3700		pF
Output Capacitance	C_{OES}				130		pF
Reverse Transfer Capacitance	C_{RES}				80		pF
Switching Characteristics							
Turn-On Delay Time	$t_{DON)}$	V_{CC}=600V, I_C=25A, R_G=10Ω, V_{GE}=15V, Inductive Load, T_C=25°C			50		ns
Rise Time	t_R				60	90	ns
Turn-Off Delay Time	$t_{DOFF)}$				190		ns
Fall Time	t_F				100	180	ns
Turn-On Switching Loss	E_{ON}				4.1	6.2	mJ
Turn-Off Switching Loss	E_{OFF}				0.96	1.5	mJ
Total Switching Loss	E_{TS}				5.06	7.7	mJ
Turn-On Delay Time	$t_{DON)}$	V_{CC}=600V, I_C=25A, R_G=10Ω, V_{GE}=15V, Inductive Load, T_C=125°C			50		ns
Rise Time	t_R				60		ns
Turn-Off Delay Time	$t_{DOFF)}$				200		ns
Fall Time	t_F				154		ns
Turn-On Switching Loss	E_{ON}				4.3	6.9	mJ
Turn-Off Switching Loss	E_{OFF}				1.5	2.4	mJ
Total Switching Loss	E_{TS}				5.8	9.3	mJ
Total Gate Charge	Q_G	V_{CE}=600V, IC=25A, V_{GE}=15V			200	300	nC
Gate-Emitter Charge	Q_{GE}				15	23	nC
Gate-Collector Charge	Q_{GC}				100	150	nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Forward Voltage Drop	V_{FM}	I_F=25A	T_C=25°C		2.0	3.0	V
			T_C=125°C		2.1		V
Reverse Recovery Time	t_{rr}	I_F=25A, dI/dt=200A/μS	T_C=25°C		235	350	ns
			T_C=125°C		300		ns
Peak Reverse Recovery Current	I_{rr}		T_C=25°C		27	40	A
			T_C=125°C		31		A
Reverse Recovery Charge	Q_{RR}		T_C=25°C		3130	4700	nC
			T_C=125°C		4650		nC