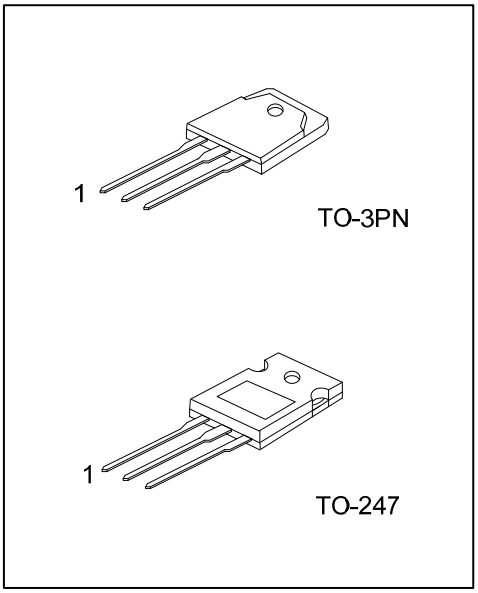
UPG25N120

Insulated Gate Bipolar Transistor

1200V, SMPS N-CHANNEL IGBT



■ DESCRIPTION

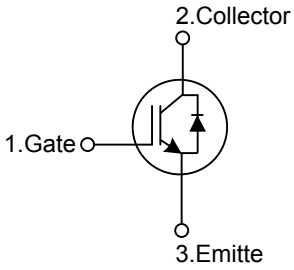
The UTC **UPG25N120** is a N-channel IGBT. it uses UTC's advanced technology to provide customers with high input impedance, high switching speed and low conduction loss, etc.

The UTC **UPG25N120** is suitable for high voltage switching, high frequency switch mode power supplies.

■ FEATURES

* $V_{CE(SAT)}$ ≤ 2.8V @ I_C=25A, V_{GE}=15V
* 1200V Switching SOA Capability
* High switching speed
* High input impedance
* Low conduction loss

■ SYMBOL



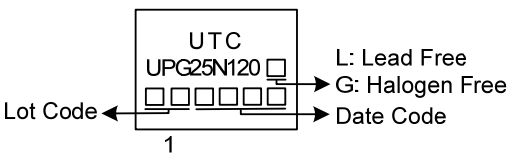
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UPG25N120L-T47-T	UPG25N120G-T47-T	TO-247	G	C	E	Tube
UPG25N120L-T3N-T	UPG25N120G-T3N-T	TO-3PN	G	C	E	Tube

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

UPG25N120G-T47-T (1)Packing Type (2)Package Type (3)Green Package	(1) T: Tube (2) T47: TO-247, T3N: TO-3PN (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_C=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage		V_{CES}	1200	V
Gate to Emitter Voltage Continuous		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 2)		I_{CM}	100	A
Power Dissipation	TO-247	P_D	350	W
	TO-3PN		390	W
Junction Temperature		T_J	-55 ~ +150	°C
Storage Temperature Range		T_{STG}	-55 ~ +150	°C

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

■ THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Case	TO-247	θ_{JC}	0.35	°C/W
	TO-3PN		0.32	°C/W

■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Collector-Emitter Breakdown Voltage	BV_{CES}	I_C=250μA, V_{GE}=0V		1200			V
Collector-Emitter Leakage Current	I_{CES}	V_{CE}=1200V, V_{GE}=0V				200	μA
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	I_C=25A, V_{GE}=15V	T_J=25°C		2.3	2.8	V
			T_J=150°C		2.65		V
Gate to Emitter Threshold Voltage	$V_{GE(TH)}$	I_C=250μA, V_{CE}=V_{GE}		4.0		6.5	V
Gate to Emitter Leakage Current	I_{GES}	V_{CE}=0V, V_{GE}=15V				±400	nA
Input Capacitance	C_{IES}	V_{CE}=25V, V_{GE}=0V, f=1MHz			1600		pF
Output Capacitance	C_{OES}				180		pF
Reverse Transfer Capacitance	C_{RES}				50		pF
Total Gate Charge	Q_G	I_C=25A, V_{CE}=100V, V_{GE}=15V			126		nC
Gate-Emitter Charge	Q_{GE}				27		nC
Gate-Collector Charge	Q_{GC}				45		nC
Current Turn-On Delay Time	$t_{D(ON)}$	I_C=25A, V_{CE}=100V, V_{GE}=15V, R_G=10Ω			16		ns
Current Rise Time	t_R				27		ns
Current Turn-Off Delay Time	$t_{D(OFF)}$				92		ns
Current Fall Time	t_F				75		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Forward Voltage Drop	V_{FM}	I_F=25A			2.1		V
Reverse Recovery Time	t_{rr}	I_F=25A, dI/dt=100A/μS			210		ns
Reverse Recovery Charge	Q_{rr}				0.35		μC

Note: Pulse Test: Pulse width≦50μs.

■ TEST CIRCUIT AND WAVEFORMS

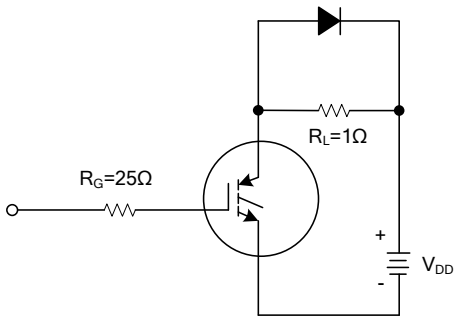


Fig 1. INDUCTIVE SWITCHING TEST CIRCUIT

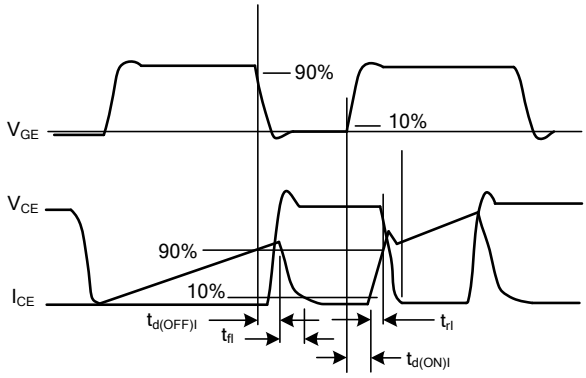
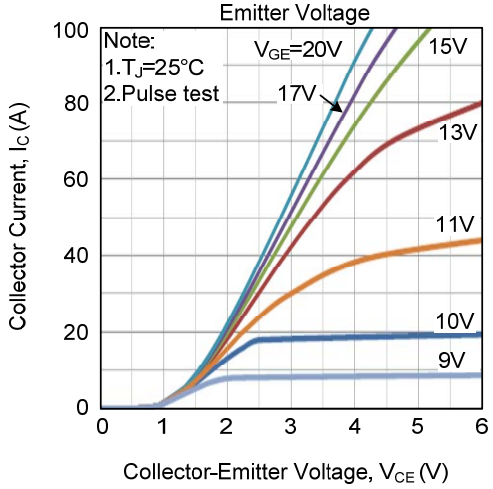


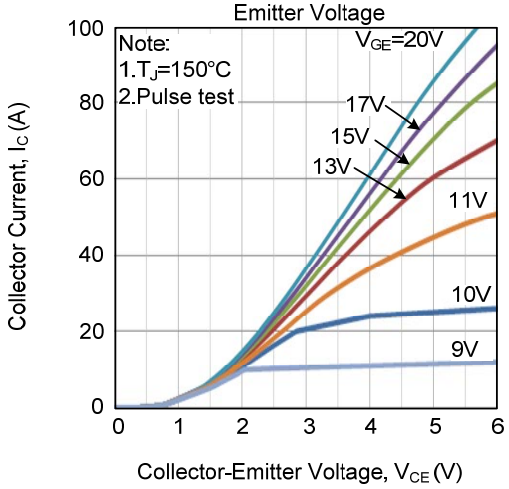
Fig 2. SWITCHING TEST WAVEFORMS

■ TYPICAL CHARACTERISTICS

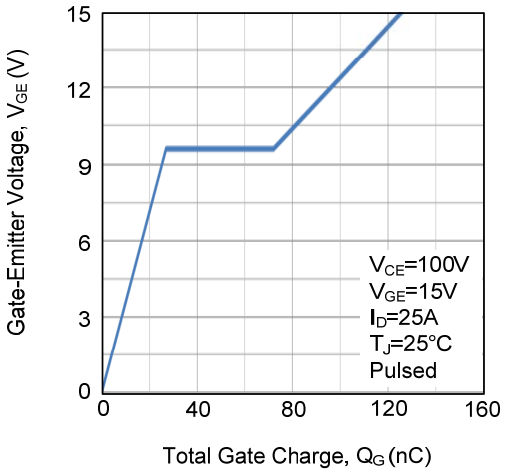
Collector Current vs. Collector-Emitter Voltage



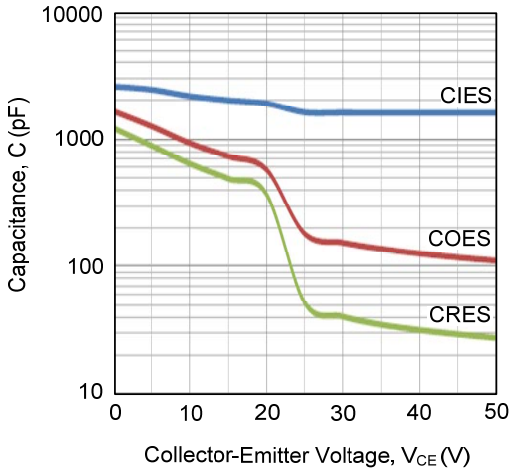
Collector Current vs. Collector-Emitter Voltage



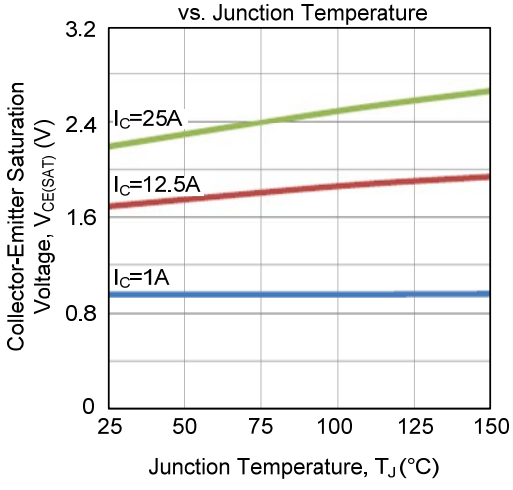
Gate Charge Characteristics



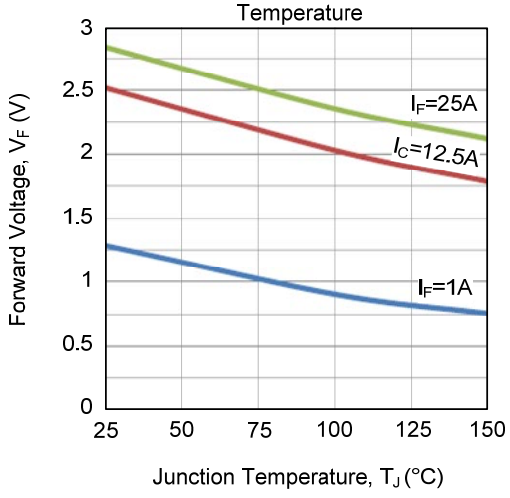
Capacitance Characteristics



Collector-Emitter Saturation Voltage vs. Junction Temperature

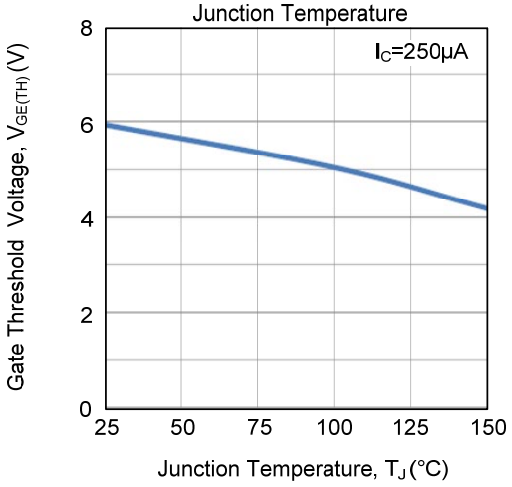


Forward Voltage vs. Junction Temperature

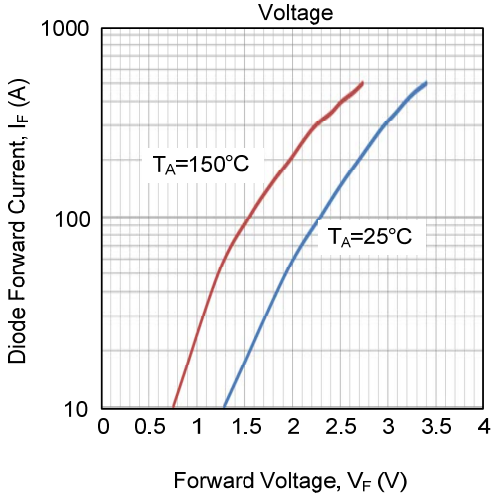


■ TYPICAL CHARACTERISTICS (Cont.)

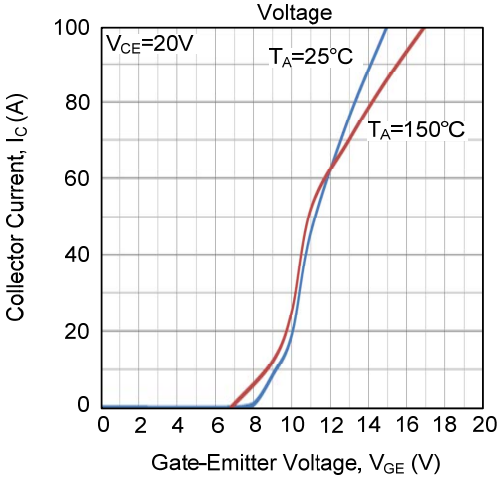
Gate Threshold Voltage vs. Junction Temperature



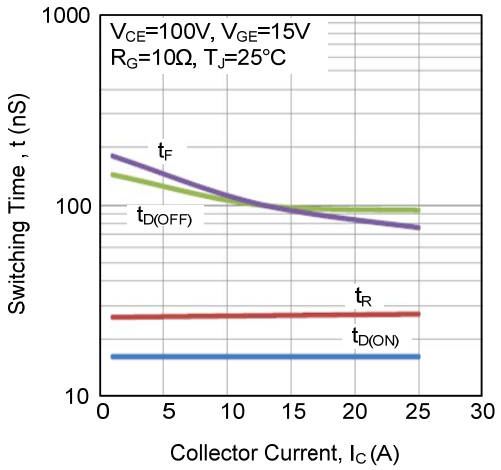
Diode Forward Current vs. Forward Voltage



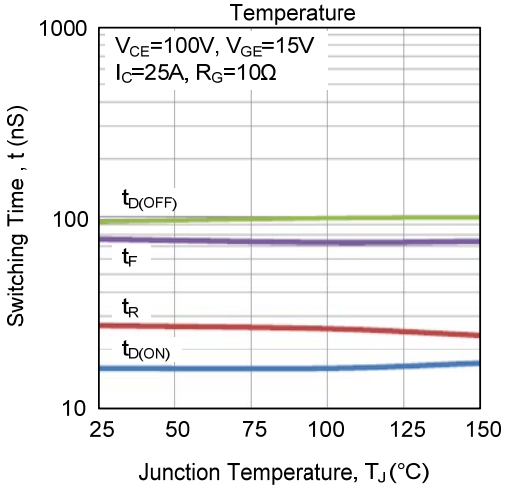
Collector Current vs. Gate-Emitter Voltage



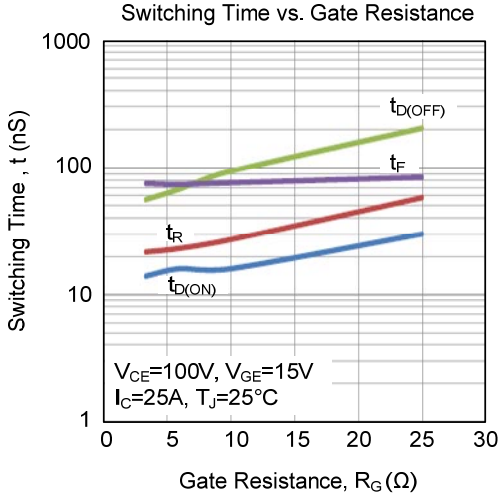
Switching Time vs. Collector Current



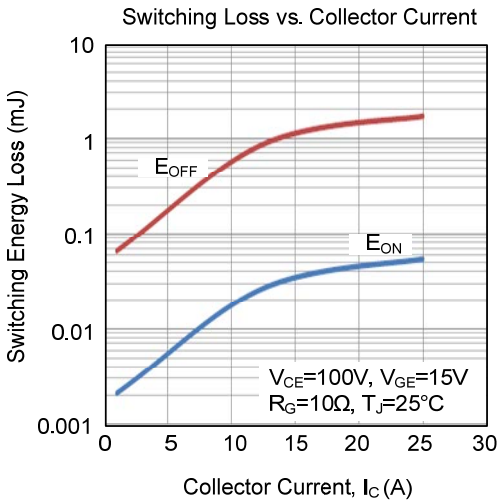
Switching Time vs. Junction Temperature

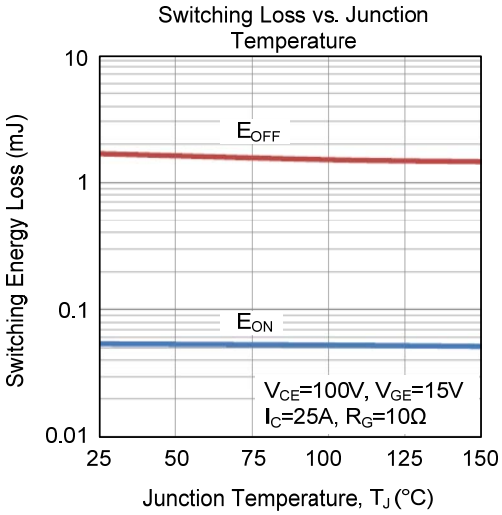


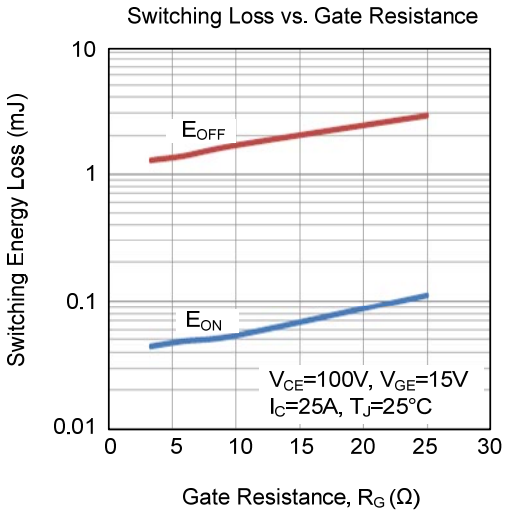
Switching Time vs. Gate Resistance

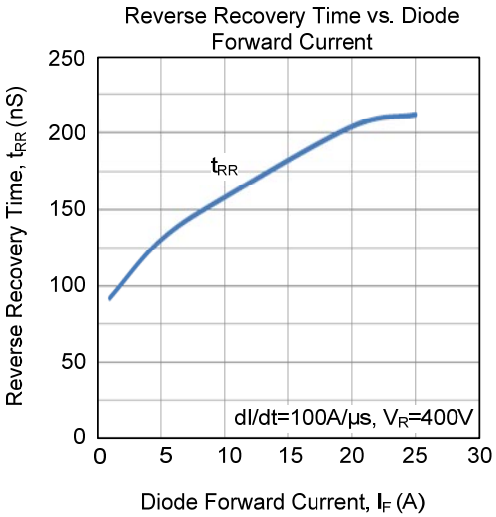


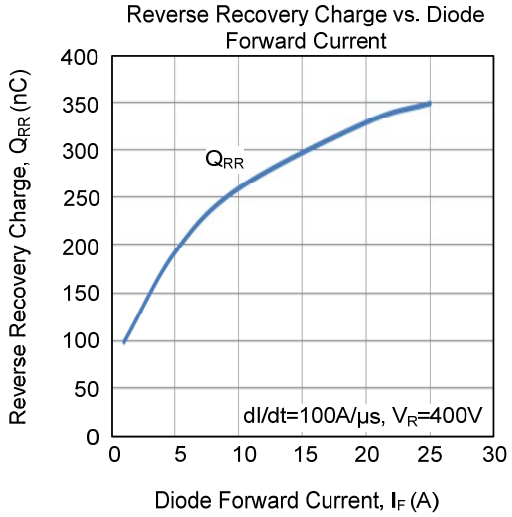
■ TYPICAL CHARACTERISTICS (Cont.)

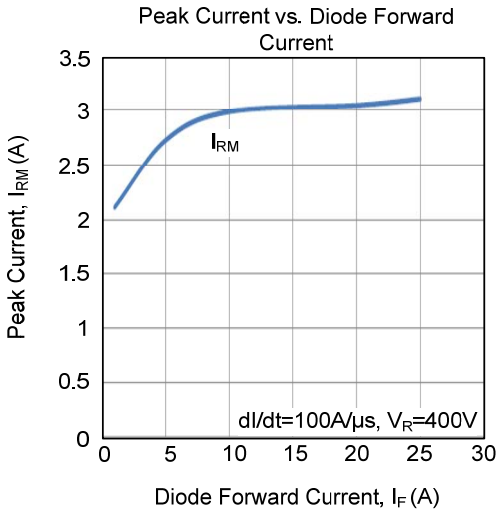






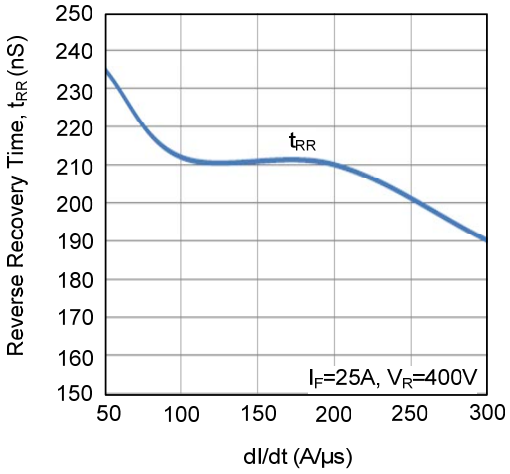




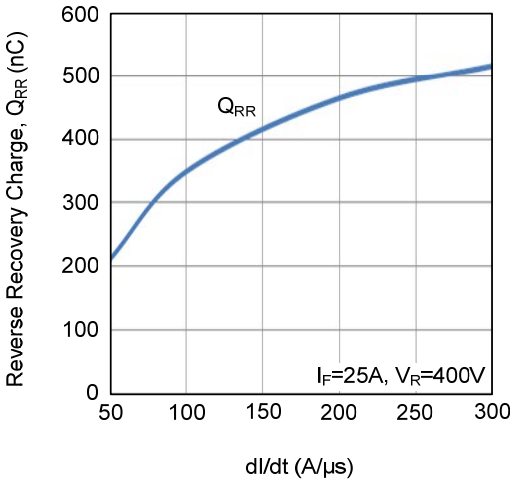


■ TYPICAL CHARACTERISTICS (Cont.)

Reverse Recovery Time vs. dI/dt



Reverse Recovery Charge vs. dI/dt



Reverse Recovery Charge vs. dI/dt