



UPGE85N33LNS1

Insulated Gate Bipolar Transistor

WITH ANTI-PARAALLEL DIODE FOR PDP SUSTAIN CIRCUIT

■ DESCRIPTION

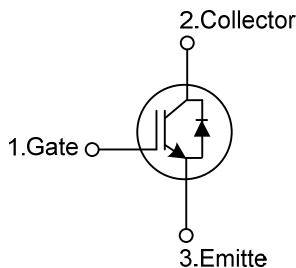
The UTC **UPGE85N33LNS1** is with Anti-Parallel Diode for PDP Sustain Circuit. it uses UTC's advanced technology to provide customers with high input impedance, high switching speed and low conduction loss, etc.

The UTC **UPGE85N33LNS1** is suitable for high voltage switching, high frequency switch mode power supplies.

■ FEATURES

- * $V_{CE(SAT)} \leq 2.3V @ I_C=50A, V_{GE}=15V$
 $V_{CE(SAT)} \leq 3.2V @ I_C=100A, V_{GE}=15V$
- * High switching speed
- * High input impedance
- * Low conduction loss

■ SYMBOL

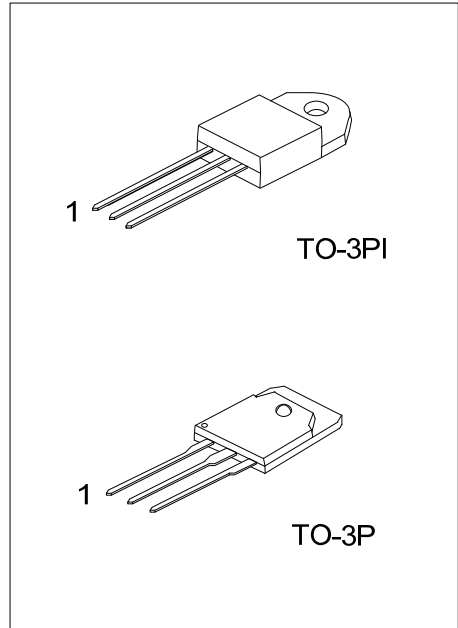


■ ORDERING INFORMATION

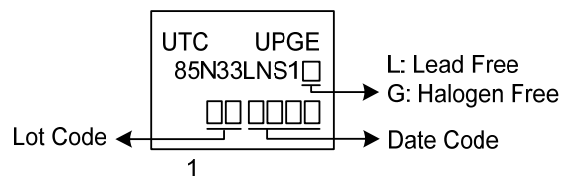
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UPGE85N33LNS1L-T3I-T	UPGE85N33LNS1G-T3I-T	TO-3PI	G	C	E	Tube
UPGE85N33LNS1L-T3P-T	UPGE85N33LNS1G-T3P-T	TO-3P	G	C	E	Tube

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

UPGE85N33LNS1G-T3I-T		(1)Packing Type	(1) T: Tube
		(2)Package Type	(2) T3F: TO-3I, T3P: TO-3P
		(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free



■ MARKING



■ **ABSOLUTE MAXIMUM RATINGS** ($T_C=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage		V_{CES}	330	V
Gate to Emitter Voltage Continuous		V_{GES}	± 30	V
Continuous Collector Current	$T_C=25^{\circ}\text{C}$	I_C	170	A
	$T_C=100^{\circ}\text{C}$		85	A
Collector Current Pulsed (Note 2)		I_{CM}	240	A
Continuous Forward Current	$T_C=25^{\circ}\text{C}$	I_F	85	A
	$T_C=100^{\circ}\text{C}$		42.5	A
Forward Current Pulsed		I_{FM}	90	A
Peak Diode Recovery dv/dt (Note 3)		dv/dt	5.7	V/ns
Power Dissipation	TO-3P	P_D	265	W
	TO-3PI		136	W
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 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.

3. $I_F \leq 30\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{CC} \leq BV_{CES}$, Starting $T_J = 25^{\circ}\text{C}$.

■ **THERMAL DATA**

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Case	TO-3P	θ_{JC}	0.47	$^{\circ}\text{C}/\text{W}$
	TO-3PI		0.92	$^{\circ}\text{C}/\text{W}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage	BV _{CES}	I _C =250μA, V _{GE} =0V	330			V
Collector-Emitter Leakage Current	I _{CES}	V _{CE} =330V, V _{GE} =0V			10	μA
Gate to Emitter Leakage Current	I _{GES}	V _{CE} =0V, V _{GE} =±20V			±100	nA
ON CHARACTERISTICS						
Collector-Emitter Saturation Voltage	V _{CE(SAT)}	I _C =50A, V _{GE} =15V	T _J =25°C		2.3	V
			T _J =150°C		1.9	V
		I _C =100A, V _{GE} =15V	T _J =25°C		3.2	V
			T _J =150°C		3.1	V
Gate to Emitter Threshold Voltage	V _{GE(TH)}	I _C =250μA, V _{CE} =V _{GE}	3.0		6.0	V
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{IES}	V _{CE} =25V, V _{GE} =0V, f=1MHz		3166		pF
Output Capacitance	C _{OES}			302		pF
Reverse Transfer Capacitance	C _{RES}			17		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q _G	I _C =85A, V _{CE} =280V, V _{GE} =15V		84		nC
Gate-Emitter Charge	Q _{GE}			25		nC
Gate-Collector Charge	Q _{GC}			31		nC
Current Turn-On Delay Time	t _{D(ON)}	I _C =85A, V _{CE} =15V, V _{CE} =240V, R _G =25Ω		48		ns
Current Rise Time	t _R			83		ns
Current Turn-Off Delay Time	t _{D(OFF)}			250		ns
Current Fall Time	t _F			400		ns
DRAIN-SOURCE DIODE CHARACTERISTICS						
Forward Voltage Drop	V _{FM}	I _F =85A, V _{GE} =0V			2.5	V
Reverse Recovery Time	t _{rr}	I _F =30A, dI/dt=100A/μS, V _{CE} =200V		47		ns
Reverse Recovery Charge	Q _{rr}			112		nC

Note: Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

■ TEST CIRCUIT AND WAVEFORMS

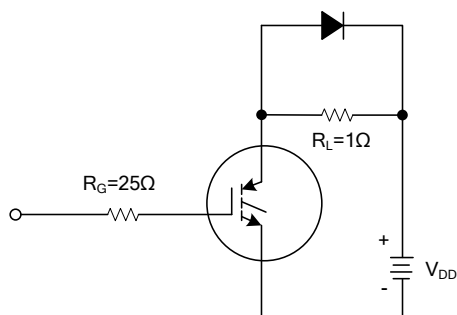


Fig 1. INDUCTIVE SWITCHING TEST CIRCUIT

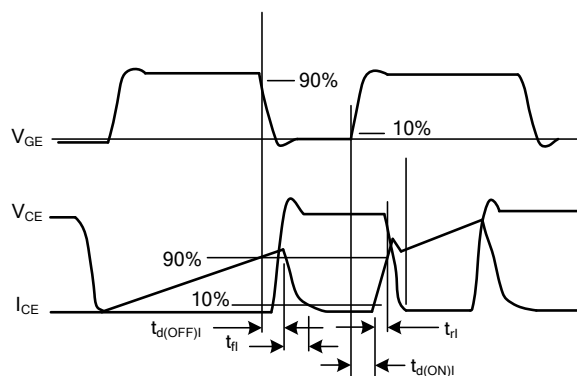
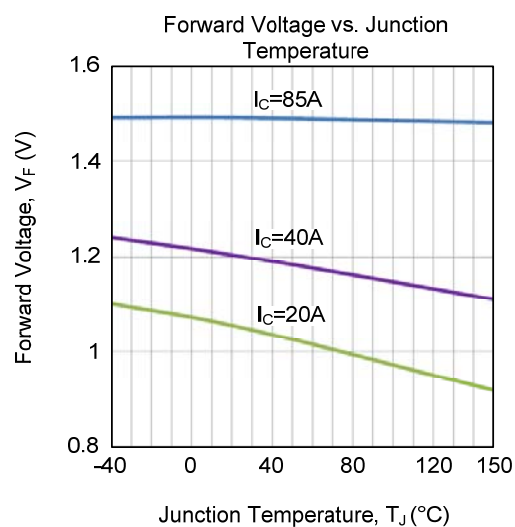
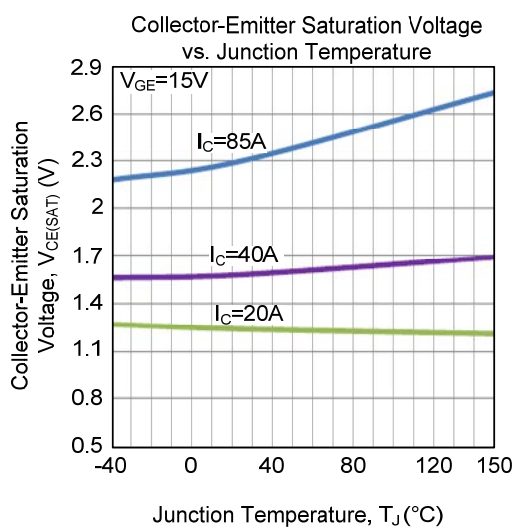
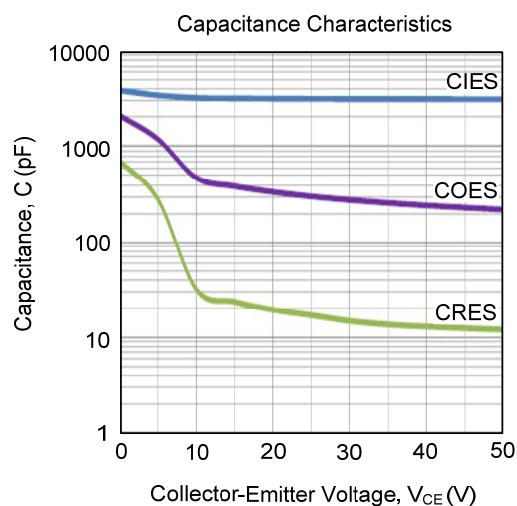
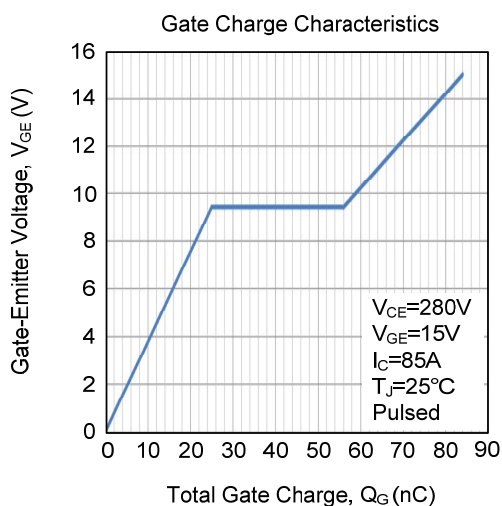
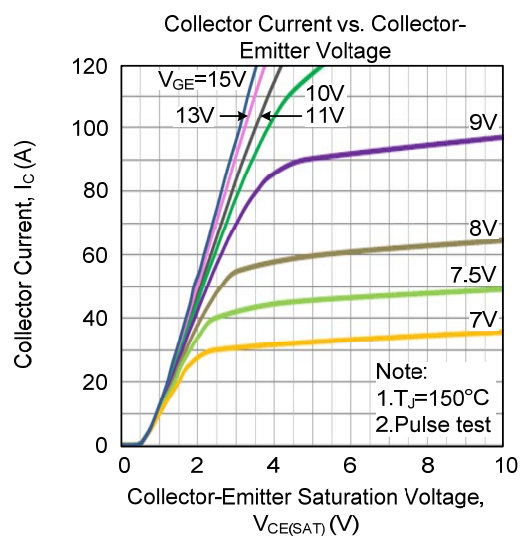
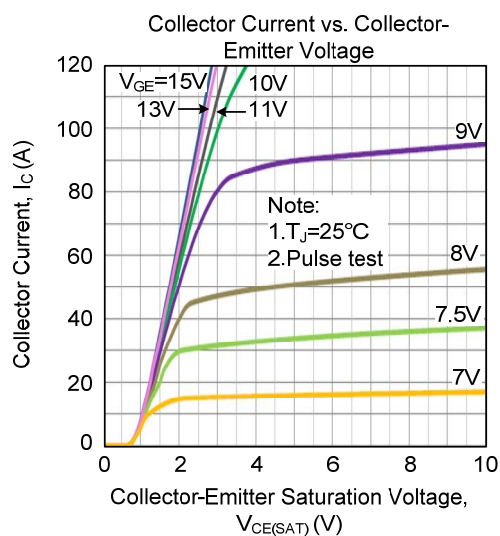
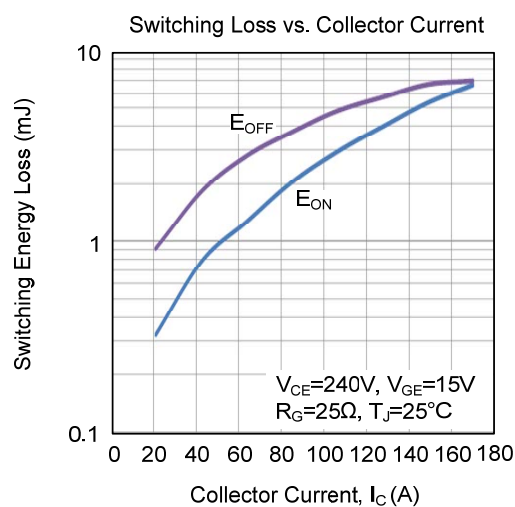
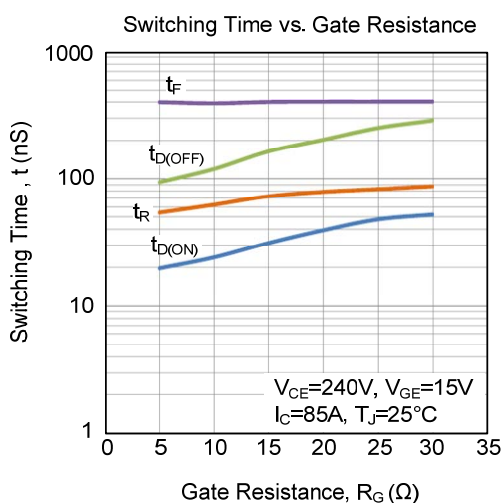
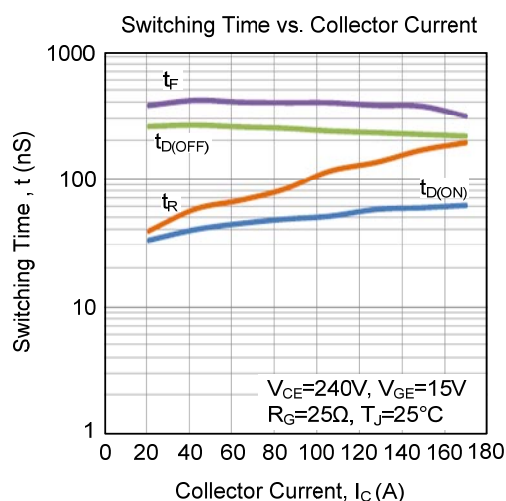
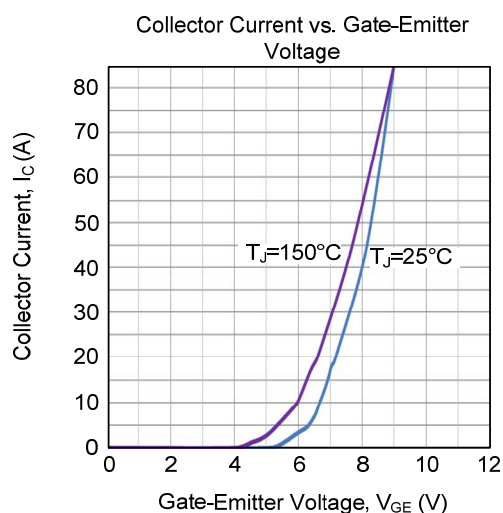
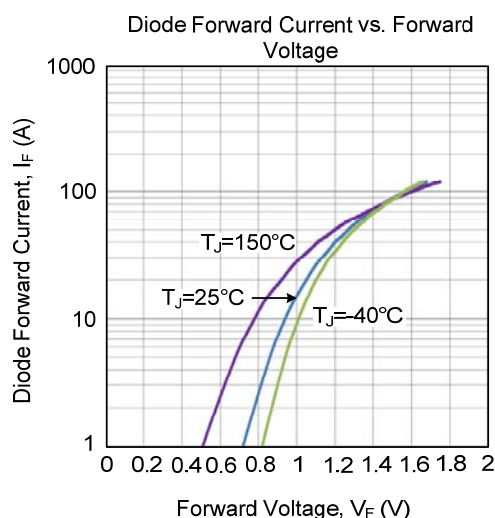
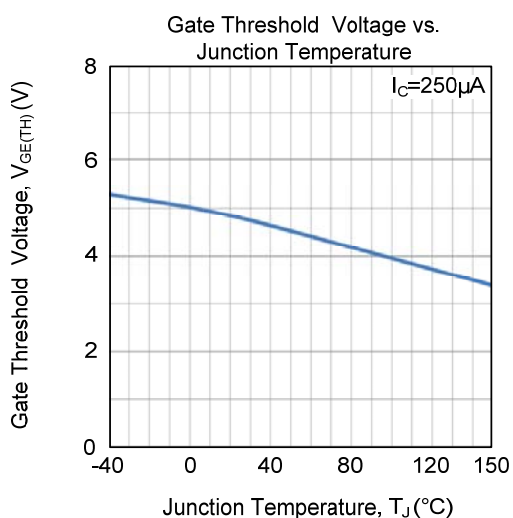


Fig 2. SWITCHING TEST WAVEFORMS

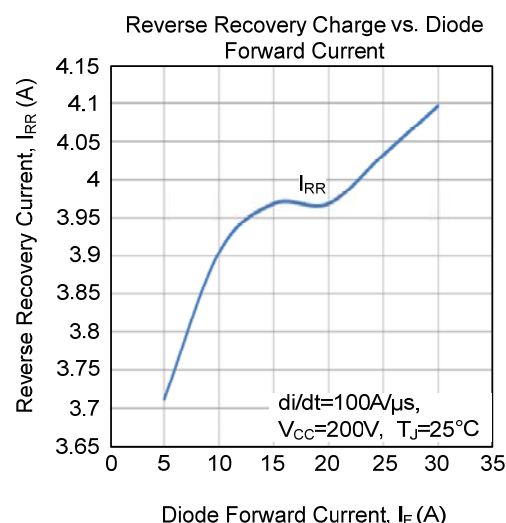
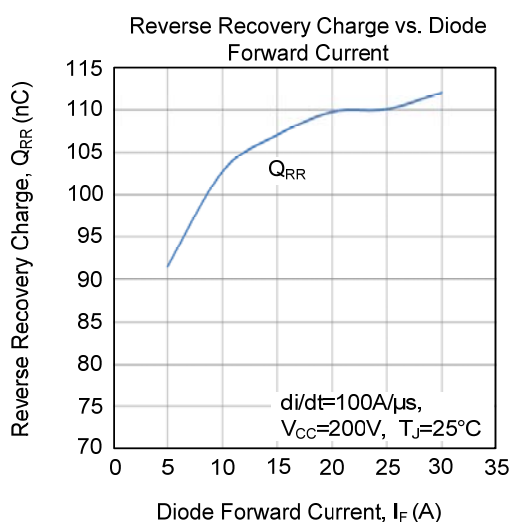
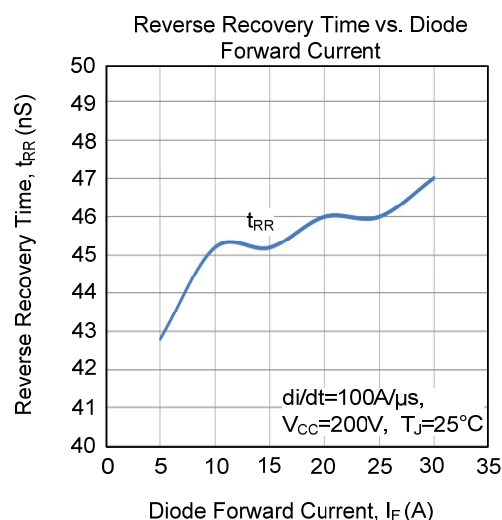
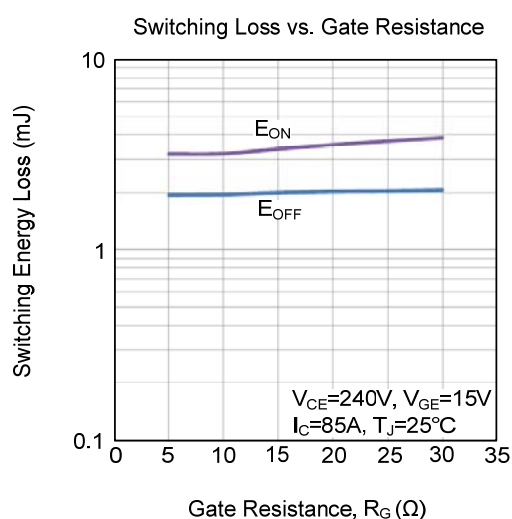
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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