



UT120N085H

Preliminary

Power MOSFET

120A, 85V N-CHANNEL POWER MOSFET

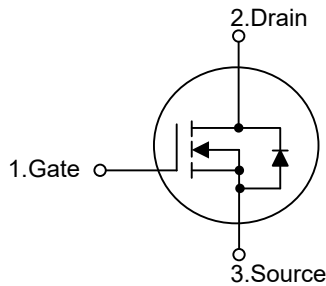
DESCRIPTION

The UTC **UT120N085H** is an N-channel enhancement mode Power FET, it uses UTC's advanced technology to provide customers a minimum on-state resistance and high switching speed.

FEATURES

- * $R_{DS(ON)} \leq 6.5 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=60\text{A}$
- * High switching speed
- * Improved dv/dt capability

SYMBOL



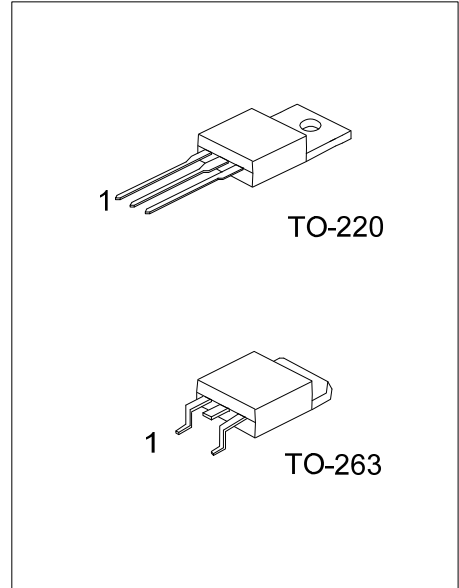
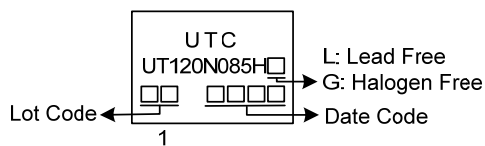
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT120N085HL-TA3-T	UT120N085HG-TA3-T	TO-220	G	D	S	Tube
UT120N085HL-TQ2-T	UT120N085HG-TQ2-T	TO-263	G	D	S	Tube
UT120N085HL-TQ2-R	UT120N085HG-TQ2-R	TO-263	G	D	S	Tape Reel

Note: Pin Assignment: G: Gate D: Drain S: Source

UT120N085HG-TA3-T	(1) Packing Type (2) Package Type (3) Green Package	(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TQ2: TO-263 (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
Drain-Source Voltage	V_{DS}	85	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current	Continuous	120	A
	Pulsed	240	A
Avalanche Energy	Single Pulsed	211	mJ
Peak Diode Recovery dv/dt (Note 4)	dv/dt	2.3	V/ns
Power Dissipation	P_D	250	W
Junction Temperature	T_J	+150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +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. $L = 0.1\text{mH}$, $I_{AS} = 65\text{A}$, $V_{DD} = 30\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$

4. $I_{SD} \leq 30\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^{\circ}\text{C}$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62.5	$^{\circ}\text{C}/\text{W}$
Junction to Case	θ_{JC}	0.5	$^{\circ}\text{C}/\text{W}$

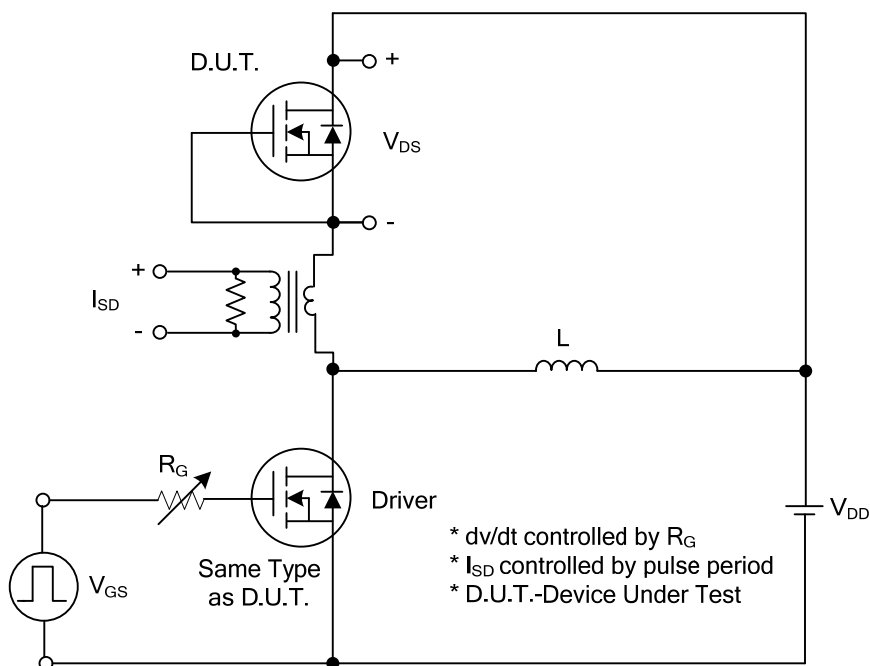
■ ELECTRICAL CHARACTERISTICS ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	85			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =85V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-20V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	I _D =250μA, V _{DS} =V _{GS}	2.0		4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =60A			6.5	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1MHz		15100		pF
Output Capacitance		C _{OSS}			840		pF
Reverse Transfer Capacitance		C _{RSS}			500		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DD} =68V, V _{GS} =10V, I _D =120A, (Note 1, 2)		220		nC
Gate to Source Charge		Q _{GS}			84		nC
Gate to Drain Charge		Q _{GD}			50		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =40V, V _{GS} =10V I _D =120A, R _G =3Ω (Note 1, 2)		28		ns
Rise Time		t _R			20		ns
Turn-OFF Delay Time		t _{D(OFF)}			58		ns
Fall-Time		t _F			22		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				120	A
Maximum Body-Diode Pulsed Current		I _{SM}				240	A
Drain-Source Diode Forward Voltage		V _{SD}	I _S =120A			1.4	V
Reverse Recovery Time		t _{rr}	I _S =30A, V _{GS} =0V		58		nS
Reverse Recovery Charge (Note 1)		Q _{rr}	dI _F /dt=100A/μs		105		nC

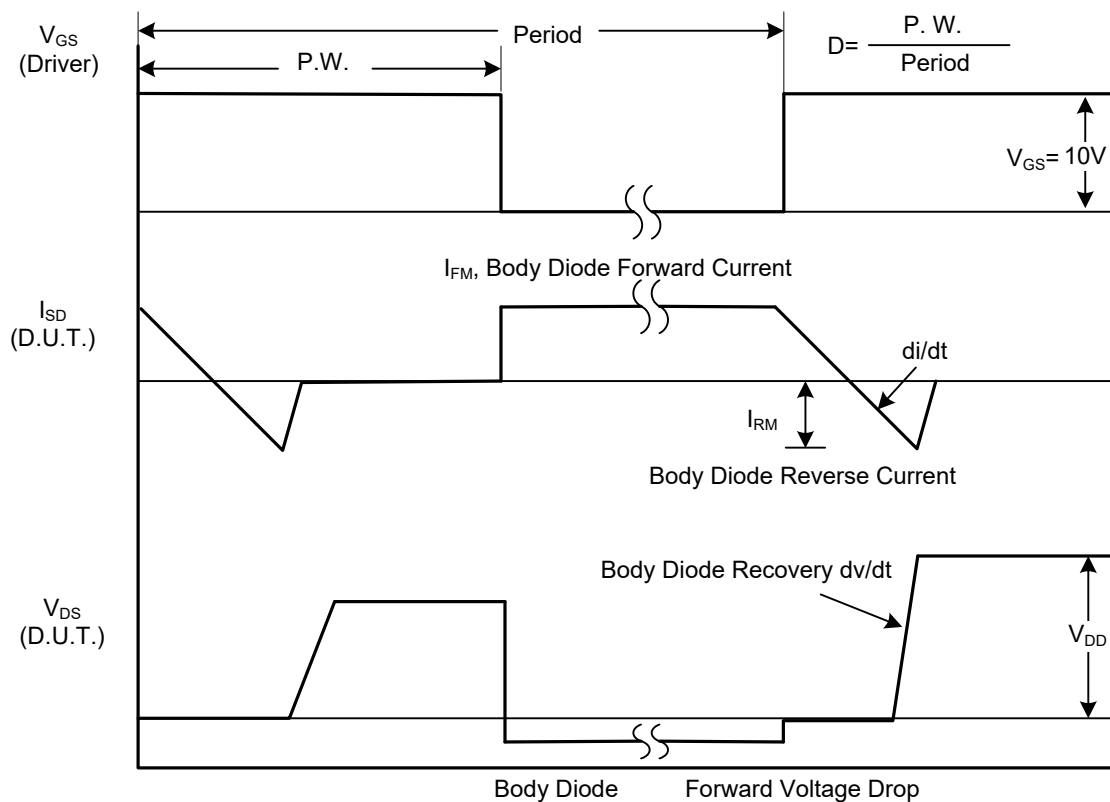
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS

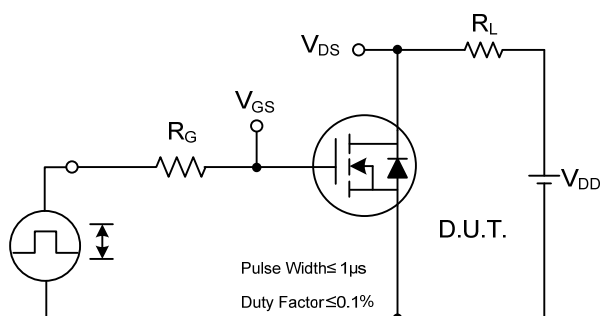


Peak Diode Recovery dv/dt Test Circuit

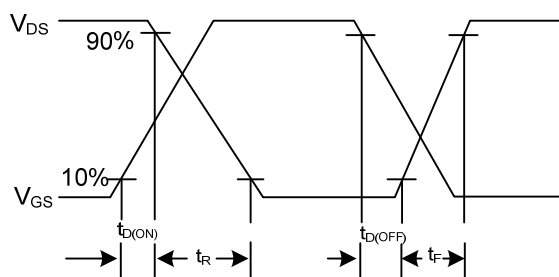


Peak Diode Recovery dv/dt Waveforms

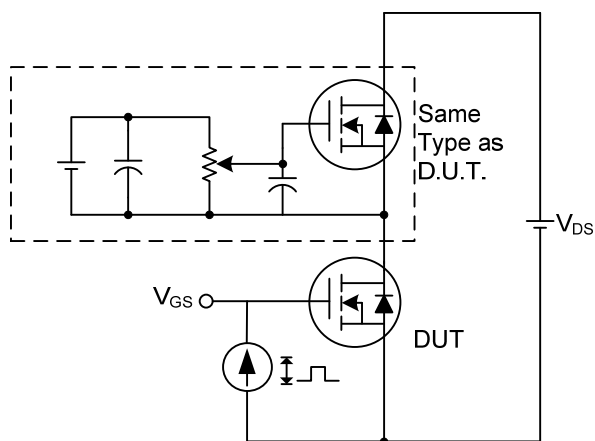
■ TEST CIRCUITS AND WAVEFORMS



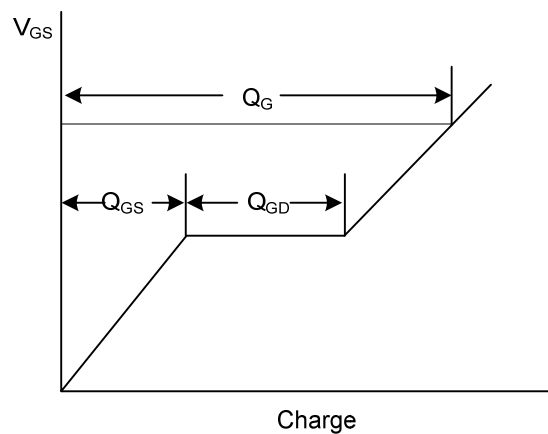
Switching Test Circuit



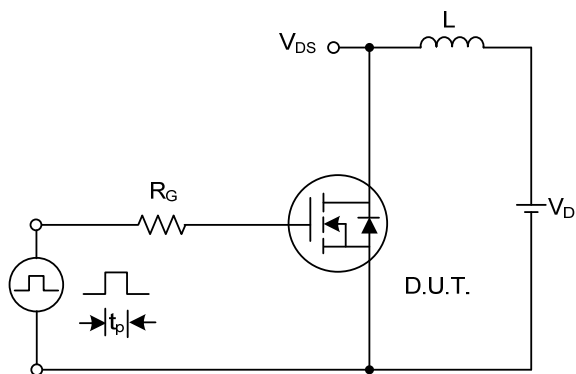
Switching Waveforms



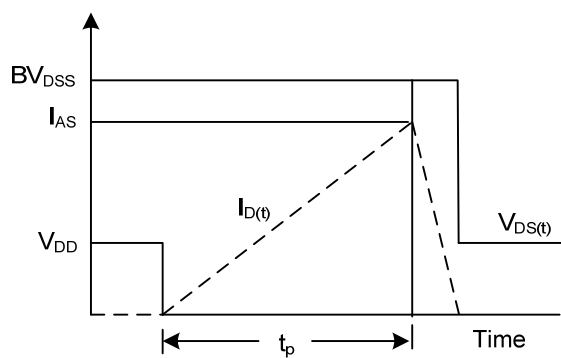
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.