



UT100N085H

Preliminary

Power MOSFET

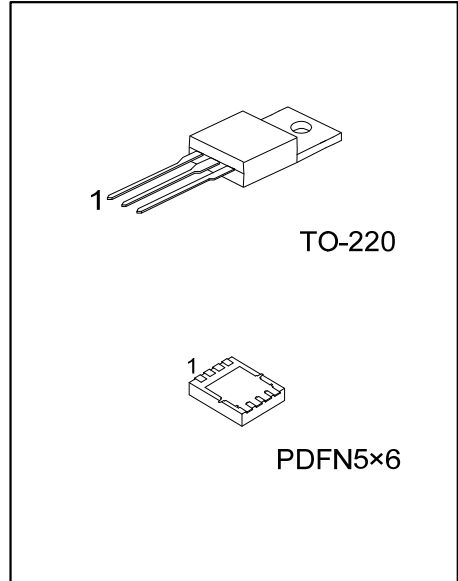
**100A, 85V N-CHANNEL
POWER MOSFET**

■ DESCRIPTION

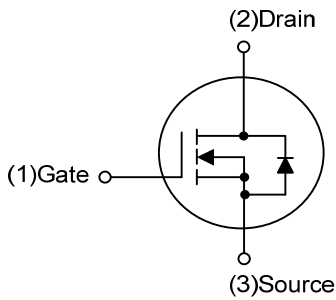
The UTC **UT100N085H** is an N-channel enhancement mode Power MOSFET, it uses UTC's advanced technology to provide customers a minimum on-state resistance and high switching speed.

■ FEATURES

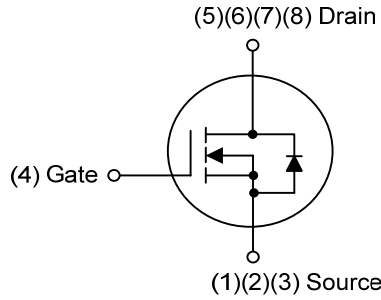
- * $R_{DS(ON)} \leq 9.6 \text{ m}\Omega @ V_{GS}=10\text{V}, I_D=50\text{A}$
- * High switching speed
- * Improved dv/dt capability



■ SYMBOL



TO-220



PDFN5x6



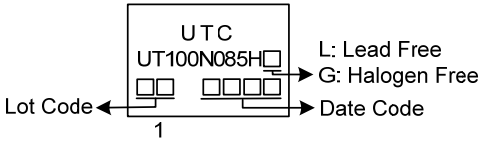
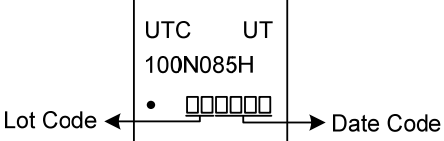
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT100N085HL-TA3-T	UT100N085HG-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UT100N085HL-P5060-R	UT100N085HG-P5060-R	PDFN5x6	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT100N085HG-TA3-T</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TA3: TO-220, P5060: PDFN5x6</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING

TO-220	PDFN5x6
 <p>The TO-220 marking diagram shows a rectangular area containing the text 'UTC' and 'UT100N085H'. Below the part number are two groups of squares: two on the left and four on the right. An arrow labeled 'Lot Code' points to the left group, and an arrow labeled 'Date Code' points to the right group. To the right of the main area, the text 'L: Lead Free' and 'G: Halogen Free' is present. A small square is located to the right of 'UT100N085H'. A '1' is printed below the left group of squares.</p>	 <p>The PDFN5x6 marking diagram shows a rectangular area containing the text 'UTC UT' and '100N085H'. Below the part number is a group of six squares with a dot to their left. An arrow labeled 'Lot Code' points to the left, and an arrow labeled 'Date Code' points to the right.</p>

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	85	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	Continuous	I_D	100	A
	Pulsed	I_{DM}	200	A
Avalanche Energy	Single Pulsed	E_{AS}	119	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	3.9	V/ns
Power Dissipation	TO-220	P_D	195	W
	PDFN5x6		45	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. $L = 1\text{mH}$, $I_{AS} = 15.4\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, 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	TO-220	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
	PDFN5x6		65 (Note)	$^\circ\text{C}/\text{W}$
Junction to Case	TO-220	θ_{JC}	0.64	$^\circ\text{C}/\text{W}$
	PDFN5x6		2.77 (Note)	$^\circ\text{C}/\text{W}$

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

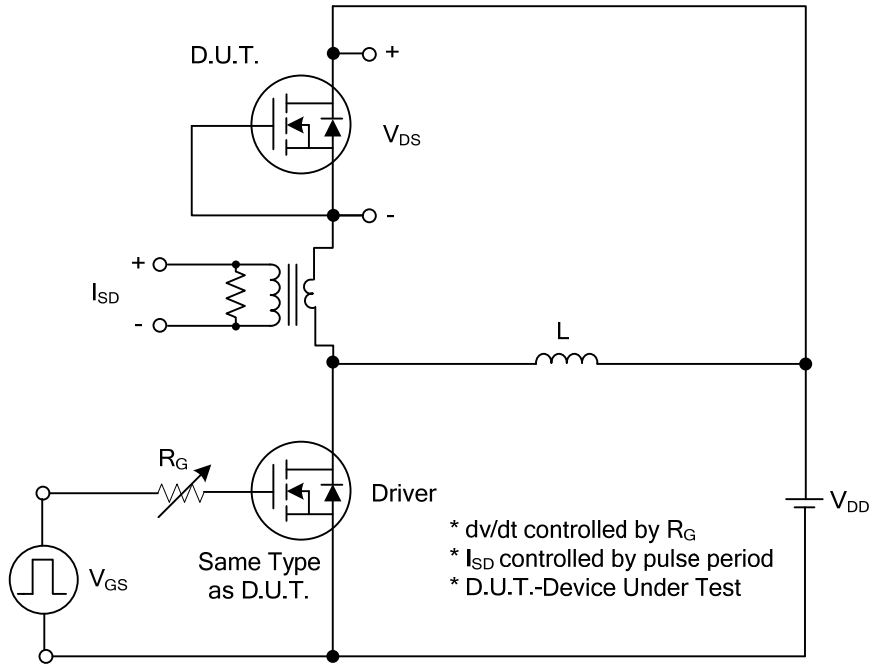
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

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}			+100	nA	
	Reverse						V _{GS} =+20V, V _{DS} =0V
		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 =50A			9.6	mΩ	
DYNAMIC PARAMETERS							
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1MHz		4514		pF	
Output Capacitance	C _{OSS}				385		pF
Reverse Transfer Capacitance	C _{RSS}				217		pF
SWITCHING PARAMETERS							
Total Gate Charge	Q _G	V _{DD} =68V, V _{GS} =10V, I _D =100A, (Note 1, 2)		98		nC	
Gate to Source Charge	Q _{GS}				21		nC
Gate to Drain Charge	Q _{GD}				47		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =42.5V, V _{GS} =10V I _D =100A, R _G =3Ω (Note 1, 2)		21		ns	
Rise Time	t _R				21		ns
Turn-OFF Delay Time	t _{D(OFF)}				44		ns
Fall-Time	t _F				28		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current	I _S				100	A	
Drain-Source Diode Forward Voltage	V _{SD}	I _S =100A			1.4	V	
Reverse Recovery Time	t _{rr}	I _S =30A, V _{GS} =0V		44		nS	
Reverse Recovery Charge (Note 1)	Q _{rr}	dI _F /dt=100A/μs		68		nC	

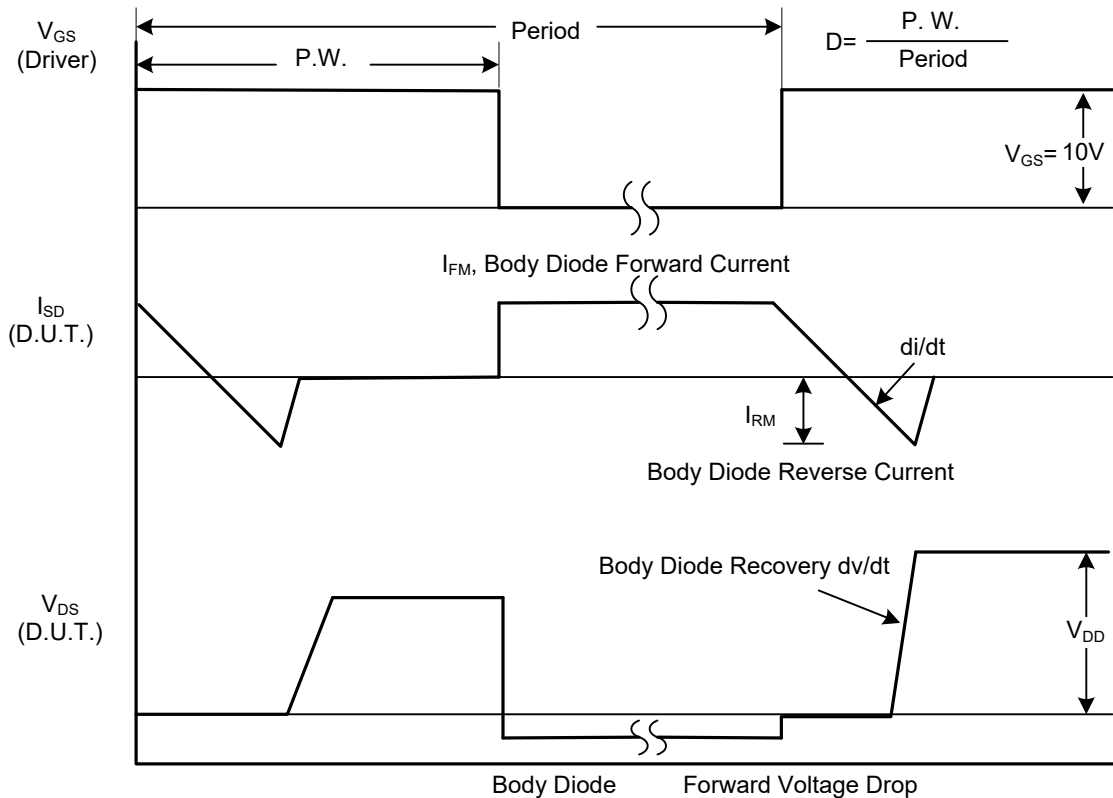
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS

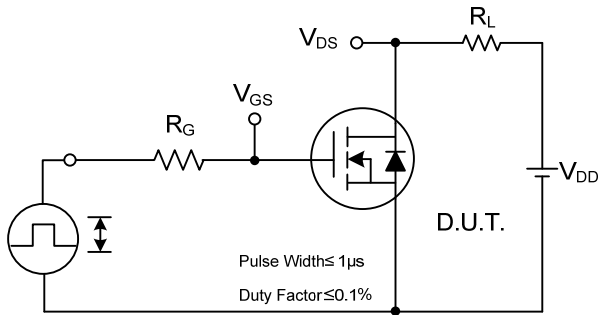


Peak Diode Recovery dv/dt Test Circuit

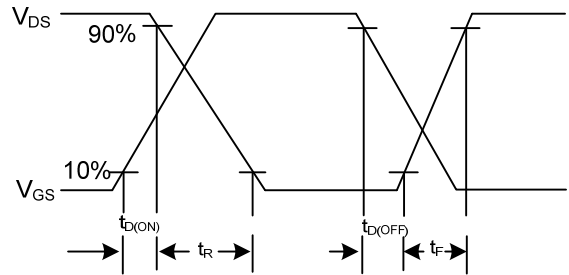


Peak Diode Recovery dv/dt Waveforms

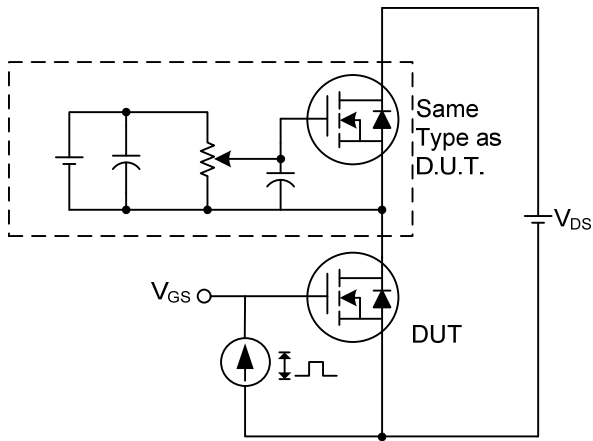
■ TEST CIRCUITS AND WAVEFORMS



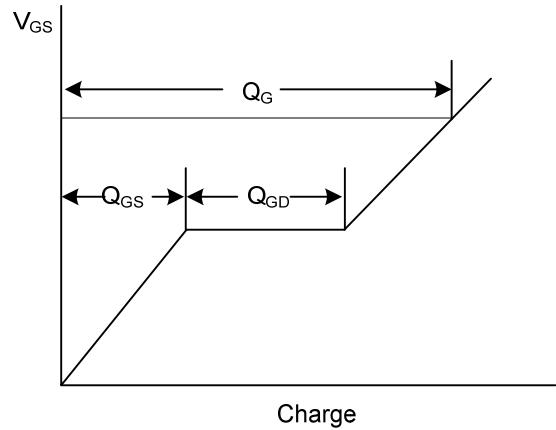
Switching Test Circuit



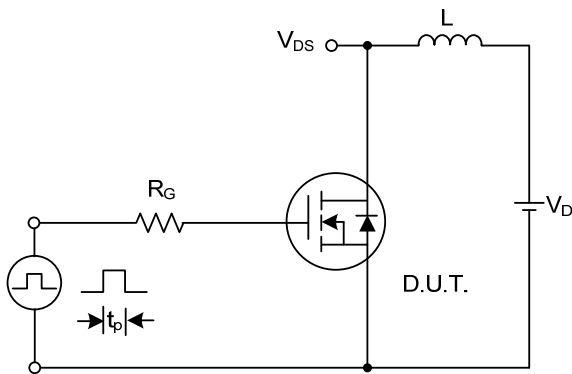
Switching Waveforms



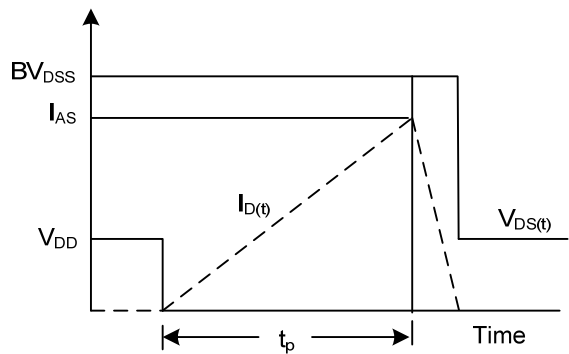
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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