



UT110N085H

Preliminary

Power MOSFET

110A, 85V N-CHANNEL POWER MOSFET

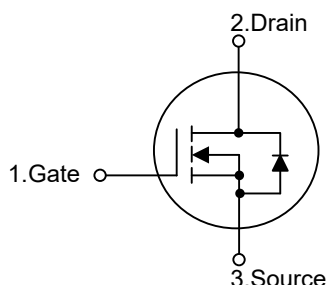
DESCRIPTION

The UTC **UT110N085H** 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

- * $R_{DS(ON)} \leq 7.0 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=55\text{A}$
- * High switching speed
- * Improved dv/dt capability

SYMBOL



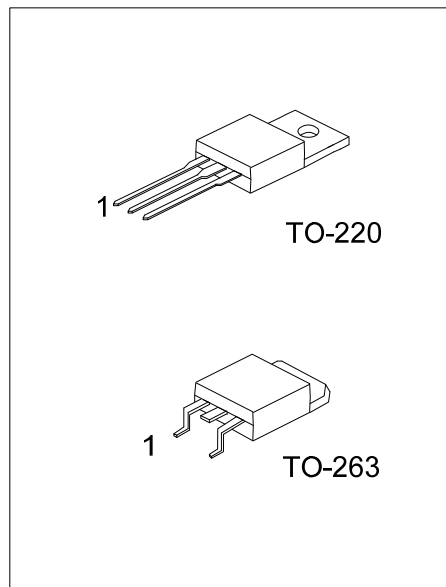
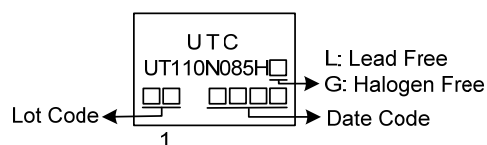
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT110N085HL-TA3-T	UT110N085HG-TA3-T	TO-220	G	D	S	Tube
UT110N085HL-TQ2-T	UT110N085HG-TQ2-T	TO-263	G	D	S	Tube
UT110N085HL-TQ2-R	UT110N085HG-TQ2-R	TO-263	G	D	S	Tape Reel

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

UT110N085HG-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
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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	I_D	110	A
	Pulsed	I_{DM}	220	A
Avalanche Energy	Single Pulsed	E_{AS}	180	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.6	V/ns
Power Dissipation		P_D	210	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. $L = 0.1\text{mH}$, $I_{AS} = 60\text{A}$, $V_{DD} = 30\text{V}$, $R_G = 25\Omega$, 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}	0.59	$^{\circ}\text{C}/\text{W}$

■ 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 =55A			7.0	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1MHz		13200		pF
Output Capacitance		C _{OSS}			760		pF
Reverse Transfer Capacitance		C _{RSS}			500		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DD} =68V, V _{GS} =10V, I _D =110A, (Note 1, 2)		200		nC
Gate to Source Charge		Q _{GS}			70		nC
Gate to Drain Charge		Q _{GD}			46		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =40V, V _{GS} =10V I _D =110A, R _G =3Ω (Note 1, 2)		22		ns
Rise Time		t _R			20		ns
Turn-OFF Delay Time		t _{D(OFF)}			52		ns
Fall-Time		t _F			20		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				110	A
Maximum Body-Diode Pulsed Current		I _{SM}				220	A
Drain-Source Diode Forward Voltage		V _{SD}	I _S =110A			1.4	V
Reverse Recovery Time		t _{rr}	I _S =30A, V _{GS} =0V		55		nS
Reverse Recovery Charge (Note 1)		Q _{rr}	dI _F /dt=100A/μs		100		nC

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

2. Essentially independent of operating ambient temperature.

D.U.T.

V_{DS}

I_{SD}

L

V_{DD}

V_{GS}

R_G

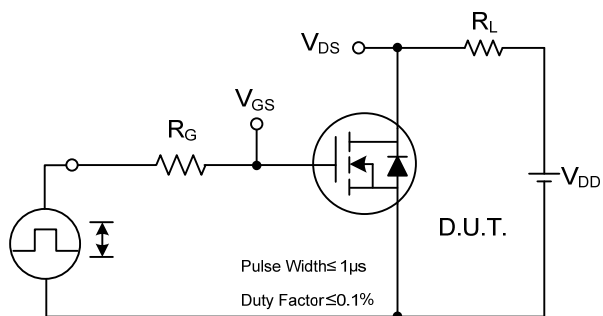
Driver

Same Type as D.U.T.

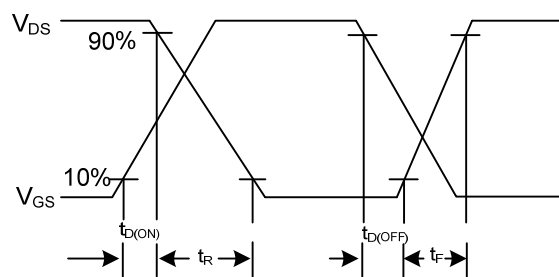
- * dv/dt controlled by R_G
- * I_{SD} controlled by pulse period
- * D.U.T.-Device Under Test

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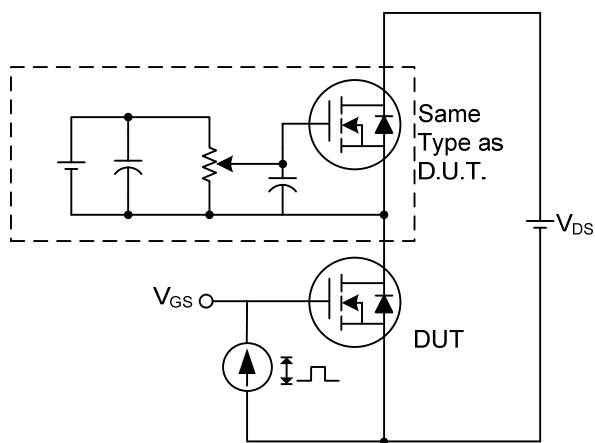
■ TEST CIRCUITS AND WAVEFORMS



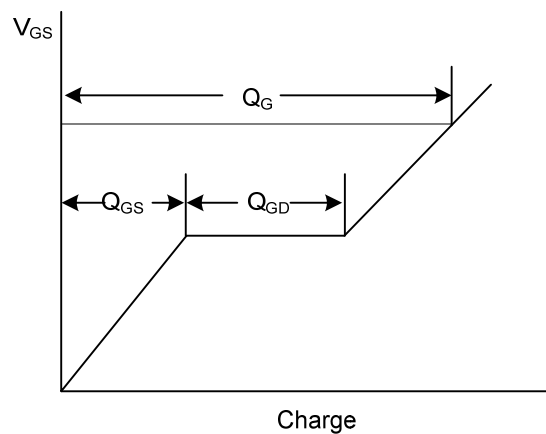
Switching Test Circuit



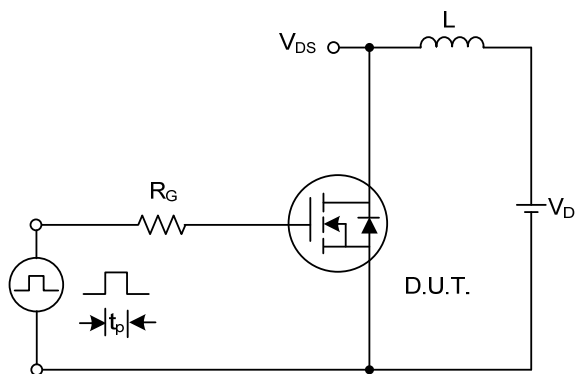
Switching Waveforms



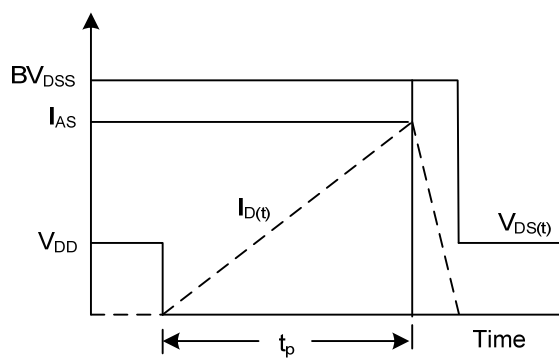
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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