



UTT24P10-H

Power MOSFET

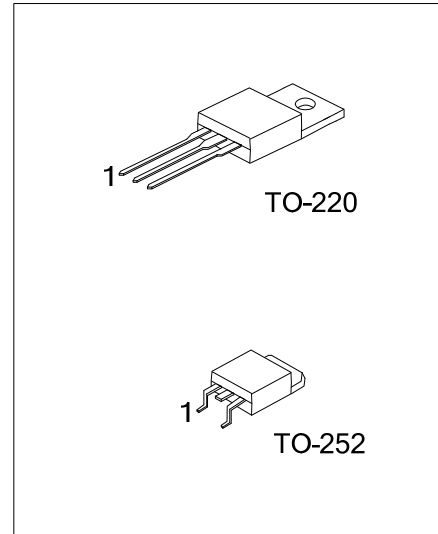
-24A, -100V P-CHANNEL POWER MOSFET

DESCRIPTION

The UTC **UTT24P10-H** is a P-channel power MOSFET using UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance. It can also withstand high energy in the avalanche.

FEATURES

- * $R_{DS(ON)} < 95\text{ m}\Omega$ @ $V_{GS} = -10\text{V}$, $I_D = -6.0\text{A}$
- * $R_{DS(ON)} < 110\text{ m}\Omega$ @ $V_{GS} = -4.5\text{V}$, $I_D = -3.0\text{A}$
- * High Switching Speed
- * Fast switching
- * 100% EAS Guaranteed
- * Improved dv/dt capability



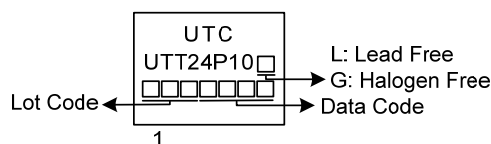
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT24P10L-TA3-T	UTT24P10G-TA3-T	TO-220	G	D	S	Tube
UTT24P10L-TN3-R	UTT24P10G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>UTT24P10G-TA3-T</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TA3: TO-220, TN3: TO-252</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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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_{DSS}	-100	V
Gate-Source Voltage			V_{GSS}	± 25	V
Continuous Drain Current	Continuous	$T_C=25^{\circ}\text{C}$	I_D	-24	A
		$T_C=100^{\circ}\text{C}$		-15.1	A
Pulsed Drain Current	Pulsed (Note 2)		I_{DM}	-96	A
Power Dissipation			P_D	125	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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62	$^{\circ}\text{C}/\text{W}$
Junction to Case	θ_{JC}	1.0	$^{\circ}\text{C}/\text{W}$

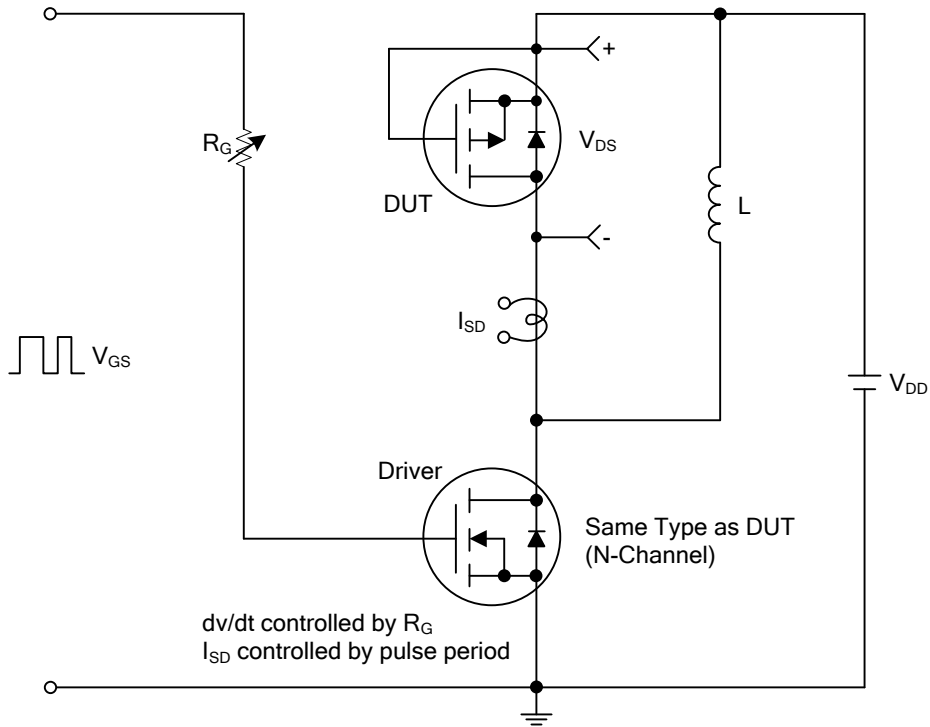
■ ELECTRICAL CHARACTERISTICS ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	-100			V	
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-100\text{V}, V_{GS}=0\text{V}, T_J=25^{\circ}\text{C}$			-1	μA	
		$V_{DS}=-80\text{V}, V_{GS}=0\text{V}, T_J=125^{\circ}\text{C}$			-10	μA	
Gate-Source Leakage Current	Forward	I_{GSS}	$V_{DS}=0\text{V}, V_{GS}=+25\text{V}$			+100	nA
	Reverse			$V_{DS}=0\text{V}, V_{GS}=-25\text{V}$			-100
ON CHARACTERISTICS							
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$	-1.2	-1.6	-2.2	V	
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10\text{V}, I_D=-6.0\text{A}$		75	95	m Ω	
		$V_{GS}=-4.5\text{V}, I_D=-3.0\text{A}$		80	110	m Ω	
DYNAMIC PARAMETERS							
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}, V_{DS}=-30\text{V}, f=1.0\text{MHz}$		2250	3900	pF	
Output Capacitance	C_{OSS}			130	250	pF	
Reverse Transfer Capacitance	C_{RSS}			90	180	pF	
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)	Q_G	$V_{DS}=-50\text{V}, V_{GS}=-10\text{V}, I_D=-6\text{A}$		40.4	70	nC	
Gate to Source Charge	Q_{GS}			7.7	15	nC	
Gate to Drain Charge	Q_{GD}			6.6	13	nC	
Turn-on Delay Time (Note 1)	$t_{D(ON)}$	$V_{DD}=-30\text{V}, V_{GS}=-10\text{V}, I_D=-1\text{A}, R_G=6\Omega$		27	54	ns	
Rise Time	t_R			12	24	ns	
Turn-off Delay Time	$t_{D(OFF)}$			150	300	ns	
Fall-Time	t_F			45	90	ns	
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Pulsed Current	I_S	$V_G=V_D=0\text{V}$, Force Current			-24	A	
Drain-Source Diode Forward Voltage (Note 1)	I_{SM}				-48	A	
Maximum Body-Diode Continuous Current	V_{SD}		$I_S=-1.0\text{A}, V_{GS}=0\text{V}$			-1.2	V

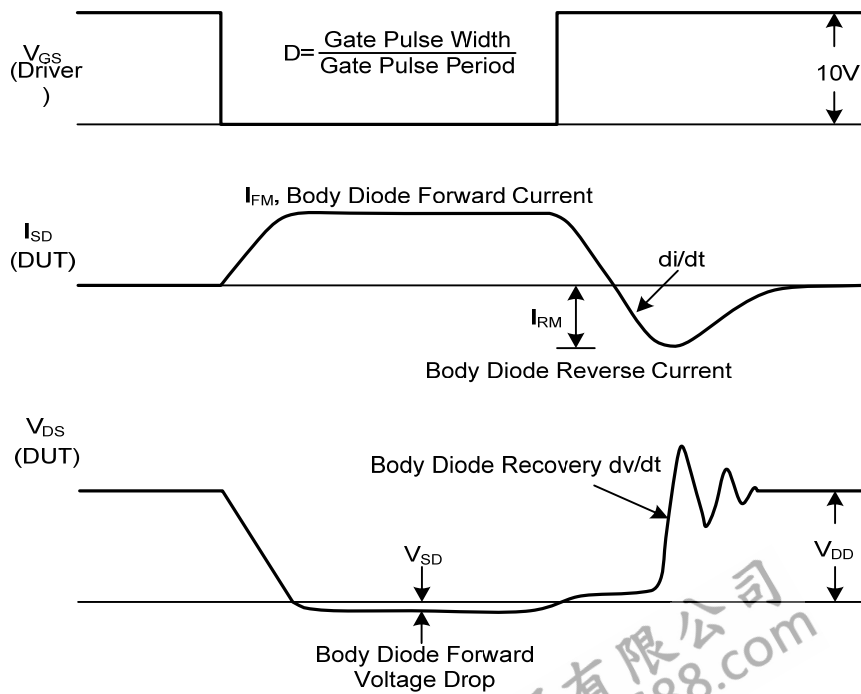
Note: 1. Pulse Test : Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

TEST CIRCUITS AND WAVEFORMS

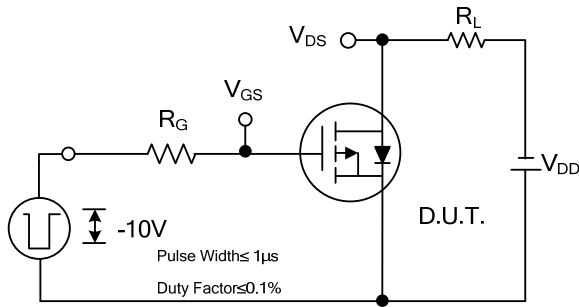


Peak Diode Recovery dv/dt Test Circuit

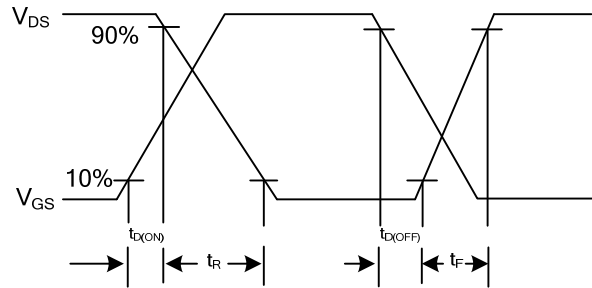


Peak Diode Recovery dv/dt Waveforms

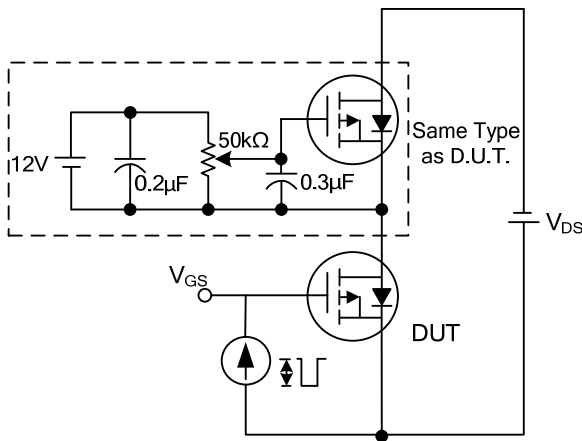
TEST CIRCUITS AND WAVEFORMS



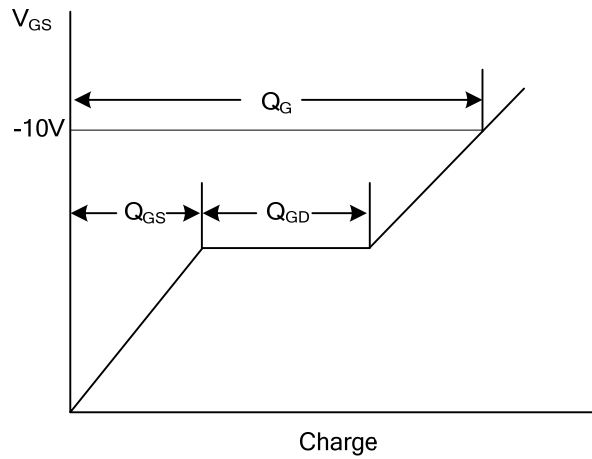
Switching Test Circuit



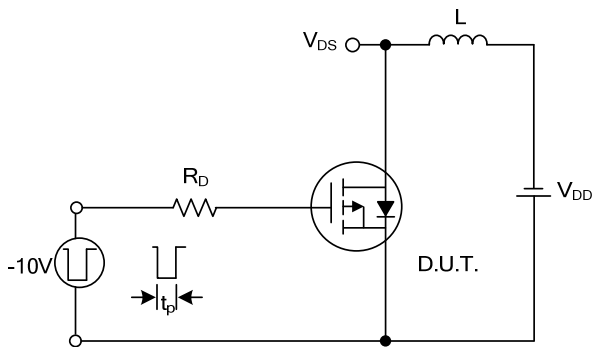
Switching Waveforms



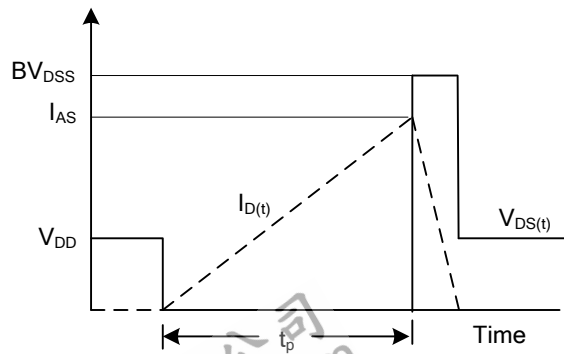
Gate Charge Test Circuit



Gate Charge Waveform

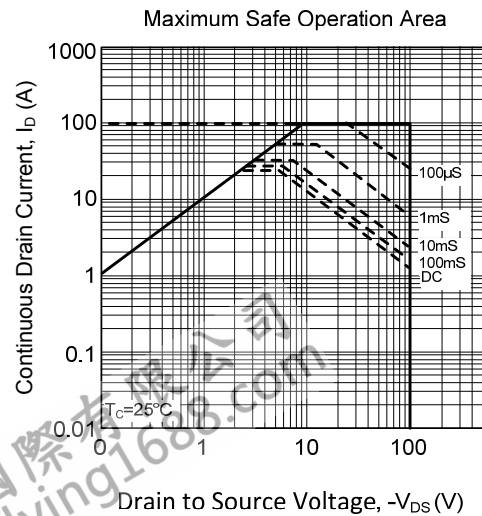
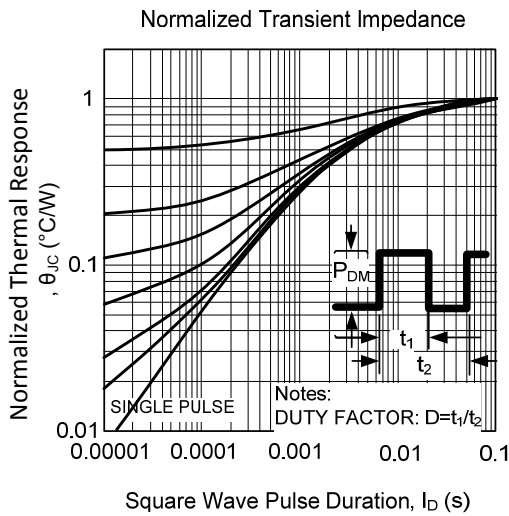
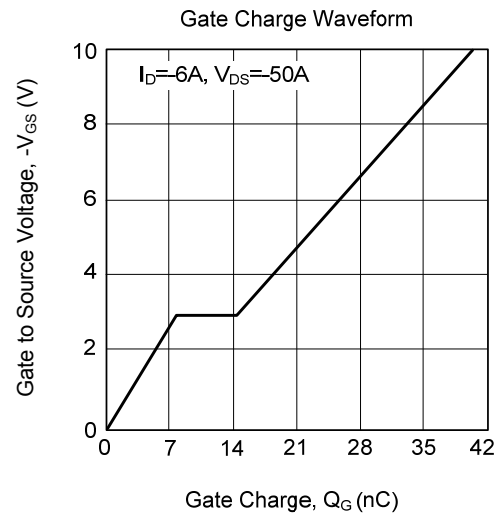
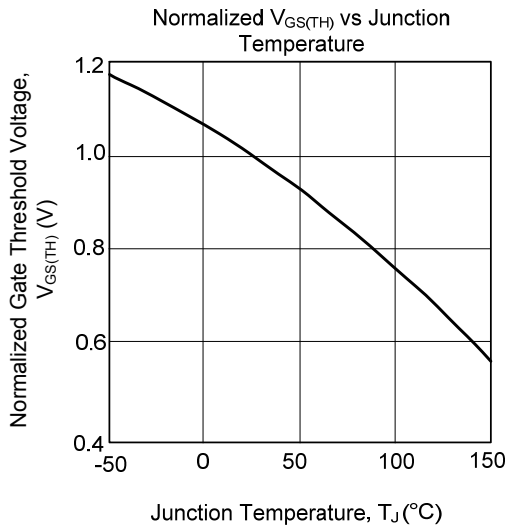
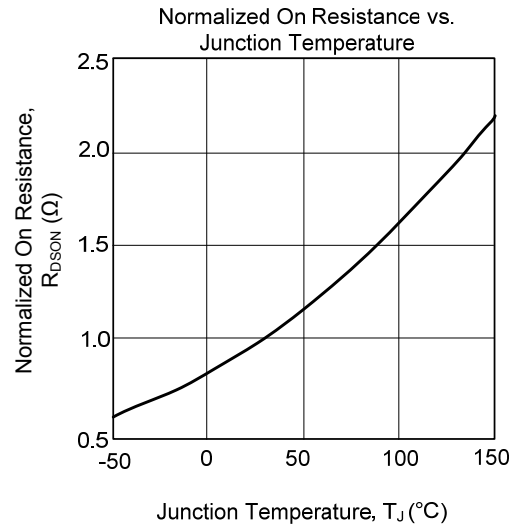
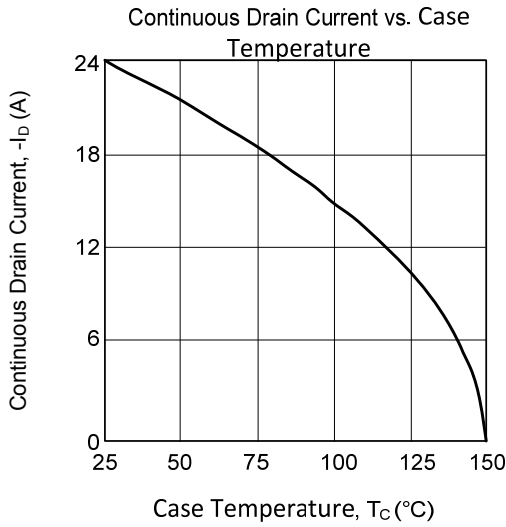


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

TYPICAL CHARACTERISTICS



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