



10N75

Preliminary

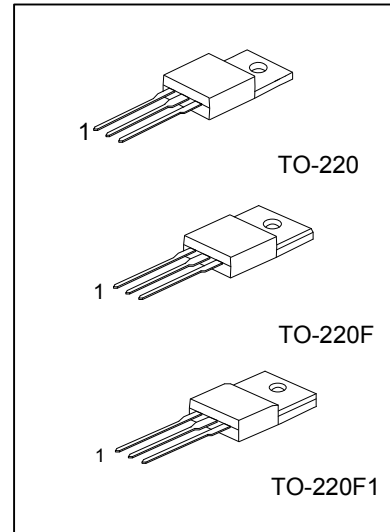
Power MOSFET

**10 Amps, 750 Volts
N-CHANNEL POWER MOSFET**

■ DESCRIPTION

The UTC **10N75** is a N-channel mode Power FET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology specialized in allowing a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

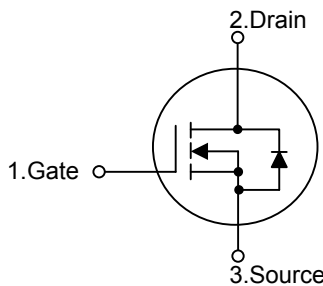
The UTC **10N75** is universally applied in high efficiency switch mode power supply, active power factor correction, electronic lamp based on half bridge topology.



■ FEATURES

- * 10A, 750V, $R_{DS(on)}=1.1\Omega @V_{GS}=10V$
- * High switching speed
- * Improved dv/dt capability
- * 100% avalanche tested

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
10N75L-TA3-T	10N75G-TA3-T	TO-220	G	D	S	Tube
10N75L-TF3-T	10N75G-TF3-T	TO-220F	G	D	S	Tube
10N75L-TF1-T	10N75G-TF1-T	TO-220F1	G	D	S	Tube

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

<p>10N75L - TA3 - T</p>	<p>(1) Packing Type (2) Package Type (3) Lead Free</p>	<p>(1) T: Tube (2) TA3: TO-220, TF3: TO-220F, TF1: TO-220F1 (3) G: Halogen Free, L: Lead Free</p>
-------------------------	--	---

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	750	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	Continuous	I_D	10	A
	Pulsed (Note 1)	I_{DM}	40	A
Avalanche Current (Note 1)		I_{AR}	10	A
Avalanche Energy	Single Pulsed (Note 2)	E_{AS}	920	mJ
	Repetitive (Note 1)	E_{AR}	24	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.0	V/ns
Power Dissipation	TO-220	P_D	156	W
	TO-220F/TO-220F1		50	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature Range		T_{STG}	-55~+150	$^\circ\text{C}$

Note: 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.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
	TO-220F/TO-220F1		62.5	$^\circ\text{C}/\text{W}$
Junction to Case	TO-220	θ_{JC}	0.8	$^\circ\text{C}/\text{W}$
	TO-220F/TO-220F1		2.5	$^\circ\text{C}/\text{W}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	750			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\mu A$, Referenced to 25°C		0.98		$V/^\circ\text{C}$
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=750V, V_{GS}=0V$			10	μA
		$V_{DS}=640V, T_C=125^\circ\text{C}$			100	μA
Gate-Source Leakage Current	Forward	$V_{DS}=0V, V_{GS}=30V$			100	nA
	Reverse	$V_{DS}=0V, V_{GS}=-30V$			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	3.0		5.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=5A$		0.93	1.1	Ω
Forward Transconductance	g_{FS}	$V_{DS}=50V, I_D=5.0A$ (Note 4)		5.8		S
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS}=25V, V_{GS}=0V, f=1.0\text{MHz}$		2150	2800	pF
Output Capacitance	C_{OSS}			180	230	pF
Reverse Transfer Capacitance	C_{RSS}			15	20	pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{DS}=600V, V_{GS}=10V, I_D=10A$ (Note 4,5)		45	58	nC
Gate-Source Charge	Q_{GS}			13.5		nC
Gate-Drain Charge	Q_{GD}			17		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=350V, I_D=10A, R_G=25\Omega$ $V_{DS}=10V$ (Note 4,5)		50	110	ns
Turn-ON Rise Time	t_R			130	270	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			90	190	ns
Turn-OFF Fall Time	t_F			80	170	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				10.0	A
Maximum Body-Diode Pulsed Current	I_{SM}				40.0	A
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=10.0A, V_{GS}=0V$			1.4	V
Body Diode Reverse Recovery Time	t_{RR}	$V_{GS}=0V, I_S=10.0A$,		730		ns
Body Diode Reverse Recovery Charge	Q_{RR}	$di/dt=100A/\mu s$ (Note 4)		10.9		μC

Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature

2. $L=17.3\text{mH}, I_{AS}=10A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$

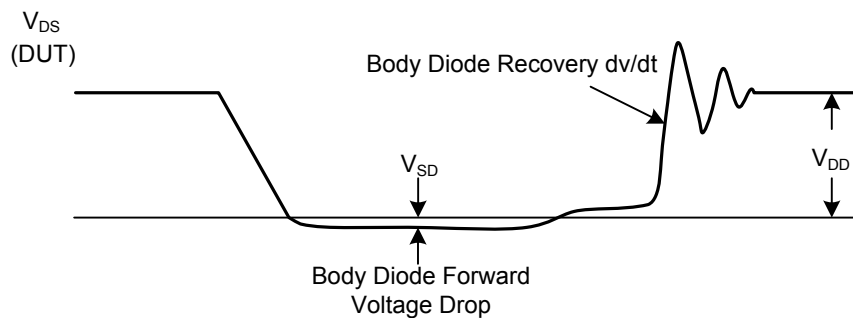
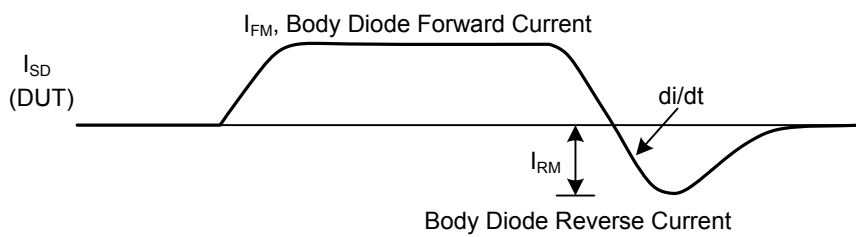
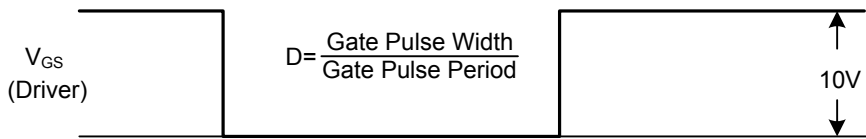
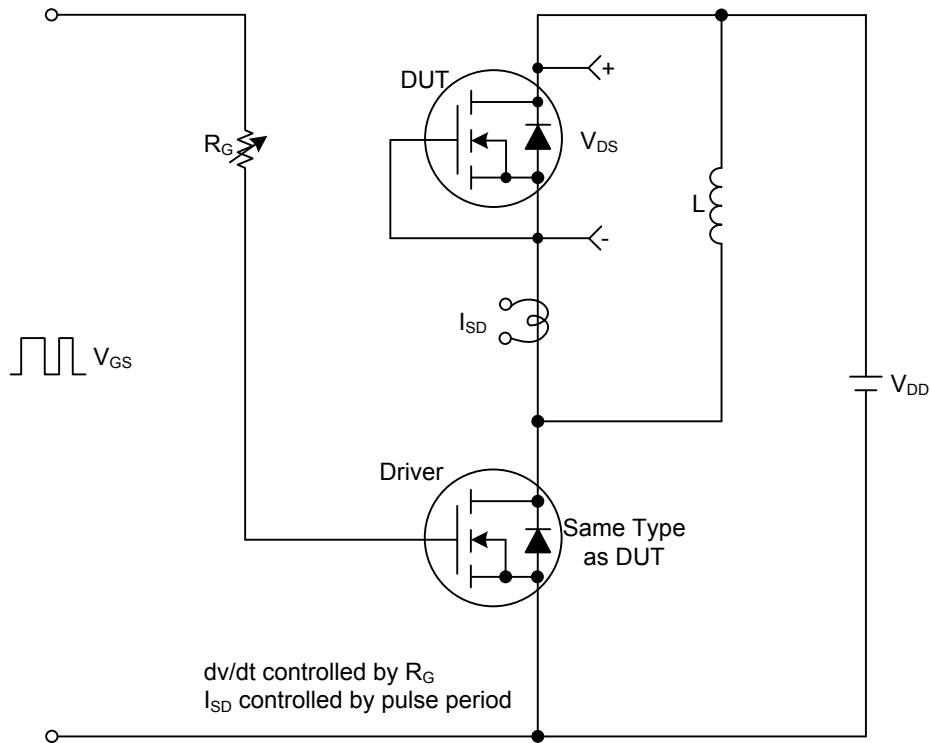
3. $I_{SD}\leq 10A, di/dt\leq 200A/\mu s, V_{DD}\leq BV_{DSS}$, Starting $T_J=25^\circ\text{C}$

4. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

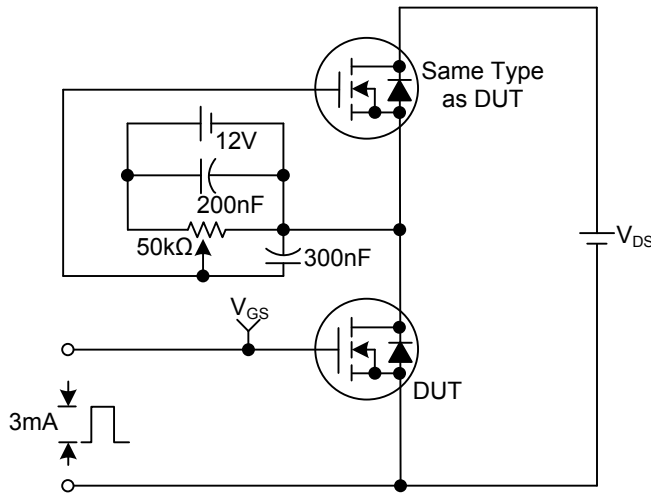
5. Essentially independent of operating temperature

■ TEST CIRCUITS AND WAVEFORMS

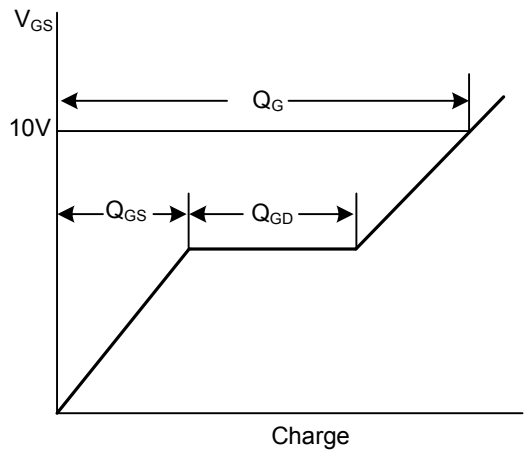
Peak Diode Recovery dv/dt Test Circuit & Waveforms



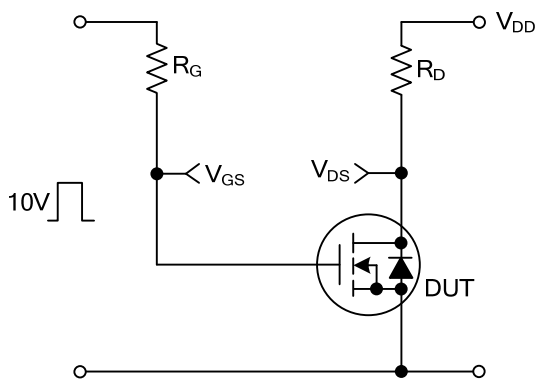
Gate Charge Test Circuit



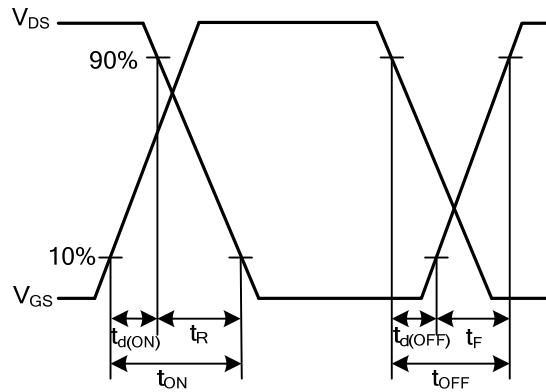
Gate Charge Waveforms



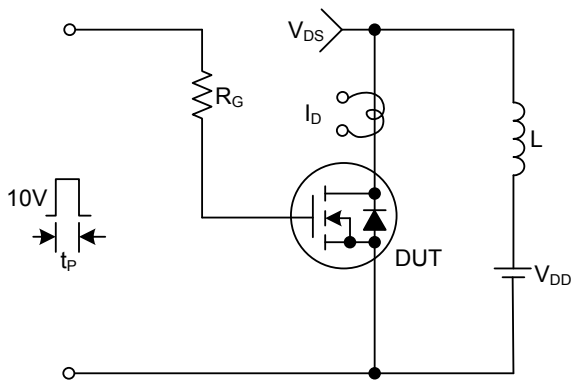
Resistive Switching Test Circuit



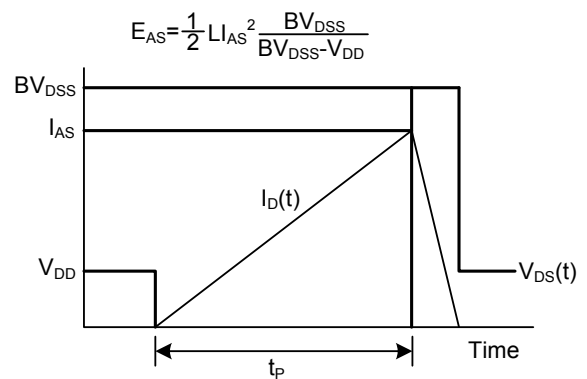
Resistive Switching Waveforms



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. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.