



15N50K-MT

Power MOSFET

15A, 500V N-CHANNEL POWER MOSFET

DESCRIPTION

The UTC **15N50K-MT** is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology allows a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

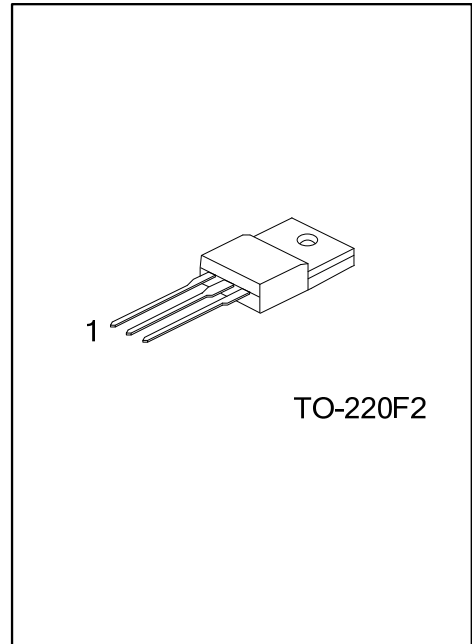
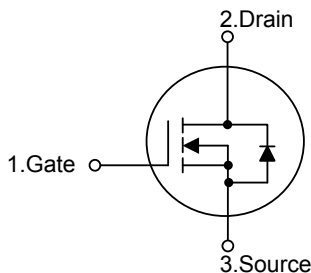
The UTC **15N50K-MT** is generally applied in high efficiency switch mode power supplies.

FEATURES

* $R_{DS(ON)} < 0.36\Omega @ V_{GS} = 10V, I_D = 7.5A$

* High Switching Speed

SYMBOL



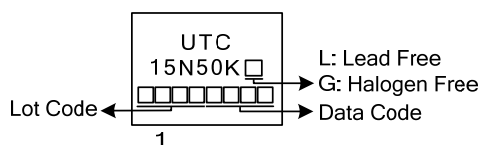
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
15N50KL-TF2-T	15N50KG-TF2-T	TO-220F2	G	D	S	Tube

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

<p>15N50KL-TF2-T</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) T: Tube (2) TF2: TO-220F2 (3) L: Lead Free, G: Halogen Free and Lead Free</p>
---	--

MARKING



15N50K-MT

Power MOSFET

■ ABSOLUTE MAXIMUM RATINGS (T_C=25°C, unless otherwise specified.) (Note 5)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain to Source Voltage		V _{DSS}	500	V
Gate-Source Voltage		V _{GSS}	±30	V
Drain Current	Continuous T _C =25°C	I _D	15	A
	Pulsed (Note 2)	I _{DM}	60	A
Avalanche Current (Note 2)		I _{AR}	15	A
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	800	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	15	V/ns
Power Dissipation (T _C =25°C)		P _D	60	W
Junction Temperature		T _J	+150	°C
Storage Temperature		T _{STG}	-55 ~ +150	°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=7.11mH, I_{AS}=15A, V_{DD}=50V, R_G=25Ω, Starting T_J=25°C

4. I_{SD}≤15A, di/dt≤200A/μs, V_{DD}≤BV_{DSS}, Starting T_J=25°C

5. Drain current limited by maximum junction temperature

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ _{JA}	62.5	°C/W
Junction to Case	θ _{JC}	2.08	°C/W

■ ELECTRICAL CHARACTERISTICS

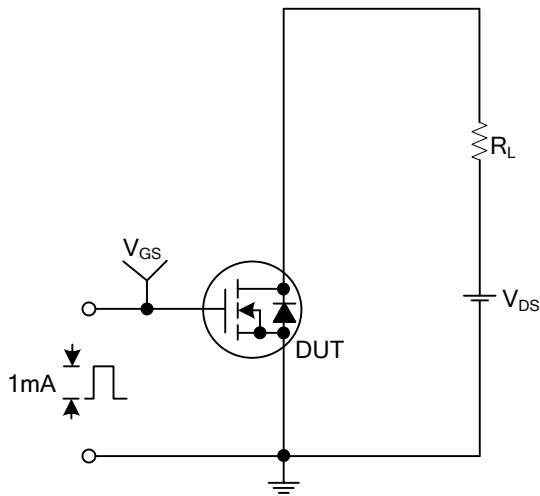
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V, T _J =25°C	500			V
Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} /ΔT _J	Reference to 25°C, I _D =250μA		0.5		V/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =500V, V _{GS} =0V			1	μA
		V _{DS} =400V, V _{GS} =0V, T _J =125°C			10	μA
Gate- Source Leakage Current	Forward	I _{GSS}			+100	nA
	Reverse					
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} =V _{DS} , I _D =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =7.5A		0.27	0.36	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		1760		pF
Output Capacitance	C _{OSS}			250		pF
Reverse Transfer Capacitance	C _{RSS}			9		pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	t _{D(ON)}	V _{DS} =30V, I _D =0.5A, R _G =25Ω (Note 1, 2)		91		ns
Rise Time	t _R			147		ns
Turn-OFF Delay Time	t _{D(OFF)}			258		ns
Fall-Time	t _F			156		ns
Total Gate Charge	Q _G	V _{GS} =10V, V _{DS} =50V, I _D =1.3A (Note 1, 2)		47.3		nC
Gate to Source Charge	Q _{GS}			13		nC
Gate to Drain ("Miller") Charge	Q _{GD}			13.2		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				15	A
Maximum Body-Diode Pulsed Current	I _{SM}				60	A
Drain-Source Diode Forward Voltage	V _{SD}	I _{SD} =15A, V _{GS} =0V			1.4	V

Notes: 1. Pulse Test: Pulse width≤300μs; Duty Cycle≤2%

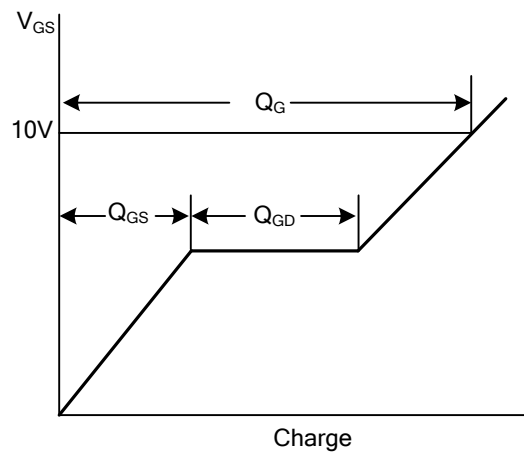
2. Essentially Independent of Operating Temperature Typical Characteristics



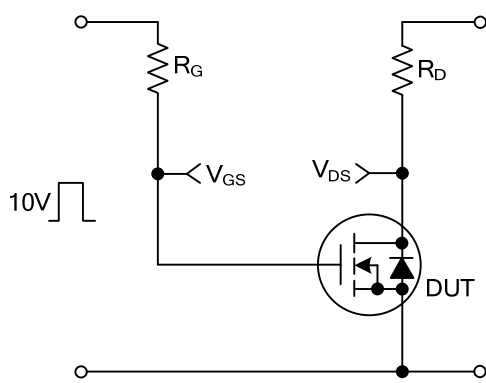
TEST CIRCUITS AND WAVEFORMS



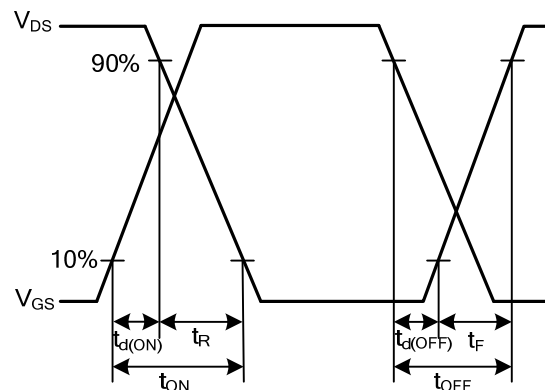
Gate Charge Test Circuit



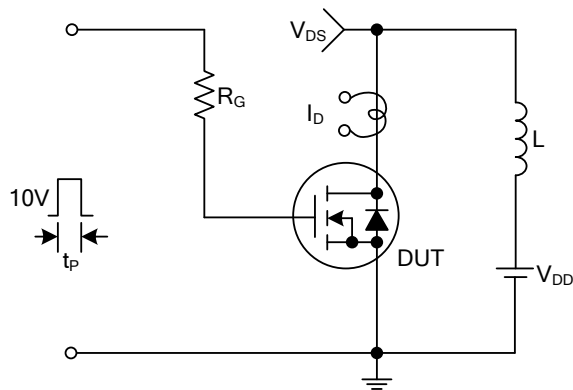
Gate Charge Waveforms



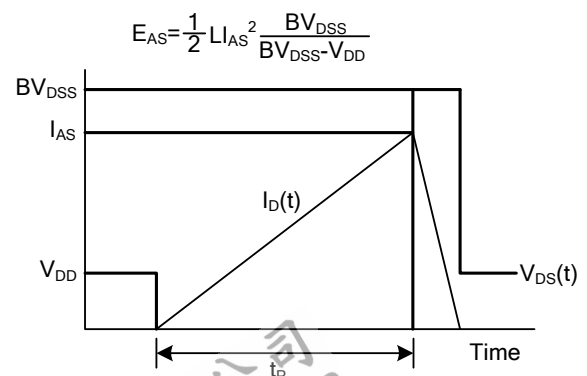
Resistive Switching Test Circuit



Resistive Switching Waveforms



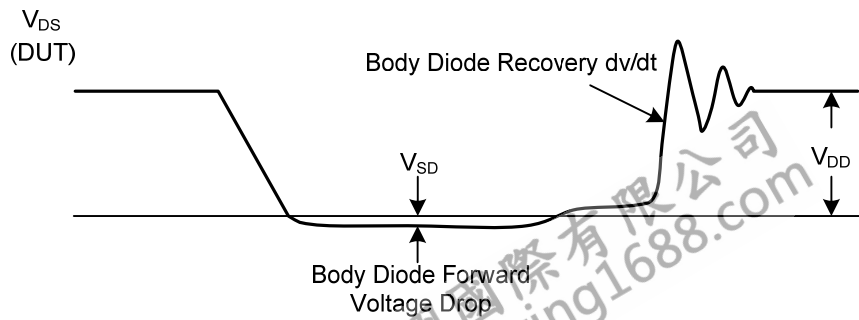
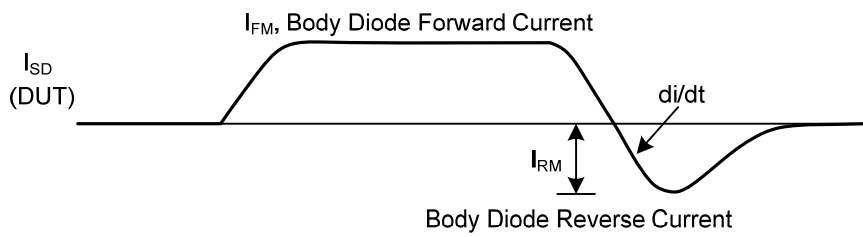
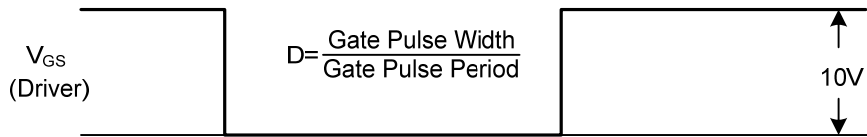
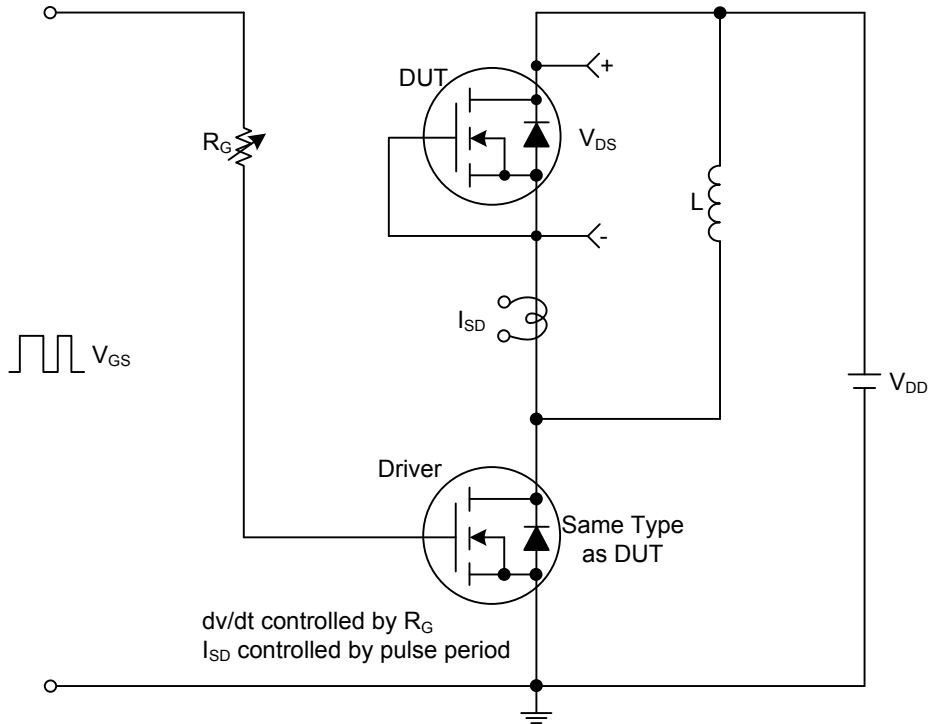
Unclamped Inductive Switching Test Circuit



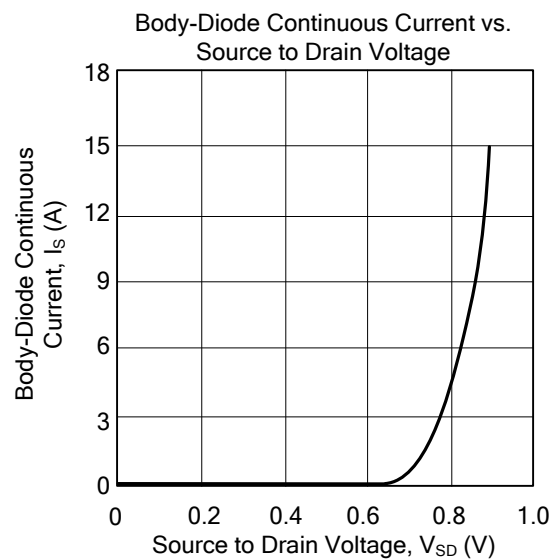
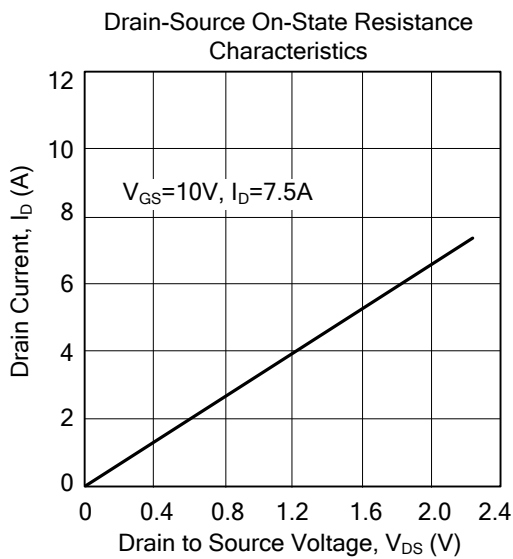
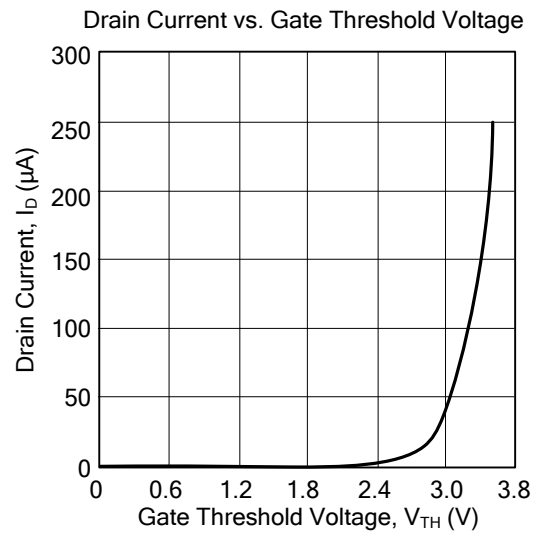
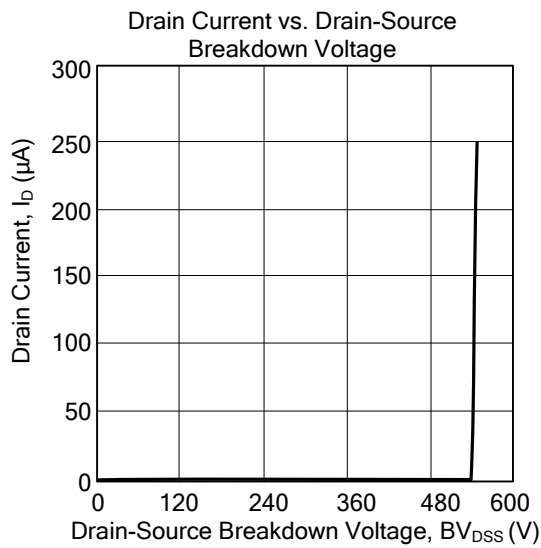
Unclamped Inductive Switching Waveforms

TEST CIRCUITS AND WAVEFORMS(Cont.)

Peak Diode Recovery dv/dt Test Circuit & Waveforms



TYPICAL CHARACTERISTICS



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.