

**17N50K-MT**

Preliminary

Power MOSFET**17A, 500V N-CHANNEL
POWER MOSFET****DESCRIPTION**

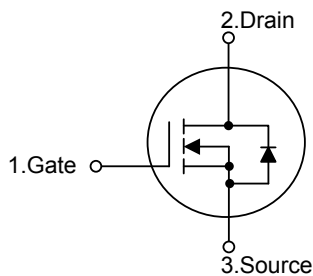
The UTC **17N50K-MT** is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology allows a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

The UTC **17N50K-MT** is generally applied in high efficiency switch mode power supplies.

FEATURES

* $R_{DS(ON)} \leq 0.30 \Omega$ @ $V_{GS}=10V$, $I_D=8.5A$

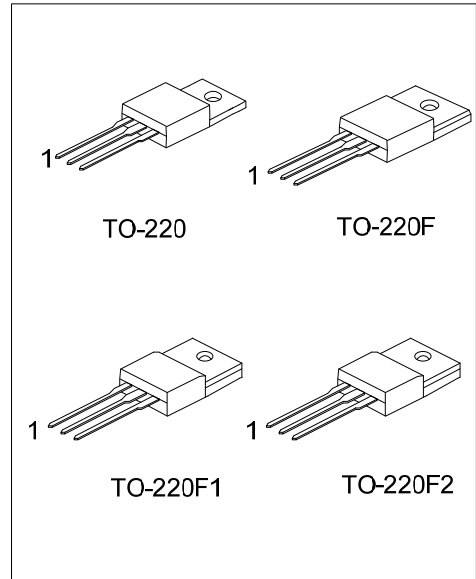
* High Switching Speed

SYMBOL**ORDERING INFORMATION**

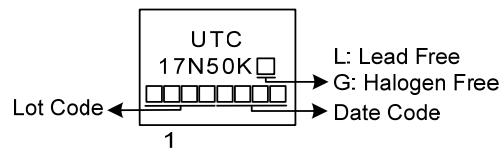
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
17N50KL-TA3-T	17N50KG-TA3-T	TO-220	G	D	S	Tube
17N50KL-TF1-T	17N50KG-TF1-T	TO-220F1	G	D	S	Tube
17N50KL-TF2-T	17N50KG-TF2-T	TO-220F2	G	D	S	Tube
17N50KL-TF3-T	17N50KG-TF3-T	TO-220F	G	D	S	Tube

Note: Pin Assignment: G: Gate C: Collector E: Emitter

17N50KG-TA3-T (1) Packing Type (2) Package Type (3) Green Package	(1) T: Tube (2) TA3: TO-220, TF3: TO-220F, TF1: TO-220F1, TF2: TO-220F2 (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}	500	V
Gate-Source Voltage			V_{GS}	± 30	V
Drain Current	Continuous	$T_C=25^{\circ}\text{C}$	I_D	17	A
	Pulsed (Note 2)		I_{DM}	68	A
Avalanche Energy			E_{AS}	911	mJ
Power Dissipation ($T_C=25^{\circ}\text{C}$)	TO-220		P_D	185	W
	TO-220F			43	W
Junction Temperature			T_J	+150	$^{\circ}\text{C}$
Storage Temperature			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. $L = 6.3\text{mH}$, $I_{AS} = 17\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$

4. $I_{SD} \leq 17\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DS}$, 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	TO-220		θ_{JC}	0.68	$^{\circ}\text{C}/\text{W}$
	TO-220F			2.91	$^{\circ}\text{C}/\text{W}$

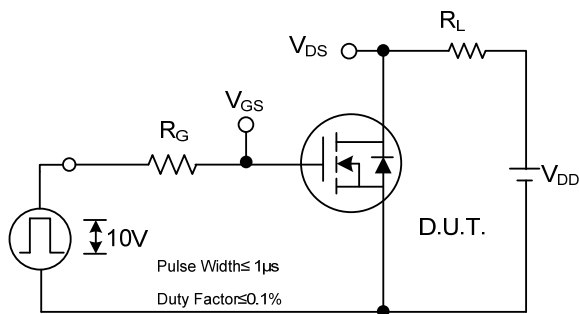
■ ELECTRICAL CHARACTERISTICS

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	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			10	μA
Gate- Source Leakage Current	Forward	I _{GSS}	V _{GS} =+30V, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-30V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =8.5A		0.22	0.30	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		2100		pF
Output Capacitance		C _{OSS}			290		pF
Reverse Transfer Capacitance		C _{RSS}			9		pF
SWITCHING PARAMETERS							
Total Gate Charge at 10V		Q _{G(TOT)}	V _{GS} =10V, V _{DS} =50V, I _D =1.3A (Note 1, 2)		55.8		nC
Gate to Source Charge		Q _{GS}			14.9		nC
Gate to Drain Charge		Q _{GD}			16		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DS} =30V, I _D =0.5A, R _G =25Ω (Note 1, 2)		110		ns
Rise Time		t _R			175		ns
Turn-OFF Delay Time		t _{D(OFF)}			305		ns
Fall-Time		t _F			168		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				17	A
Maximum Body-Diode Pulsed Current		I _{SM}				68	A
Drain-Source Diode Forward Voltage		V _{SD}	I _{SD} =17A, V _{GS} =0V			1.5	V

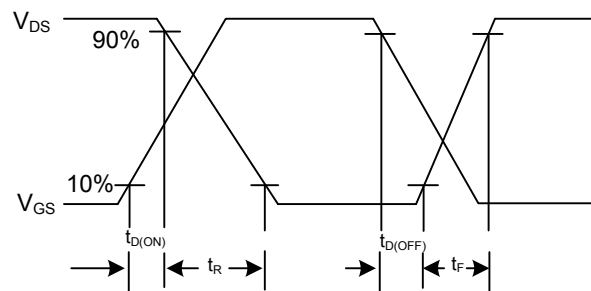
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially Independent of Operating Temperature Typical Characteristics.

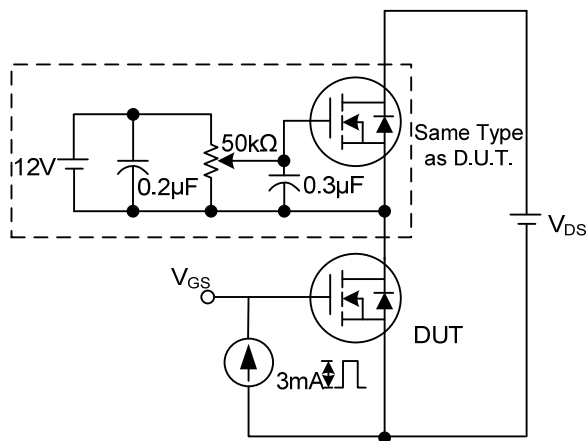
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



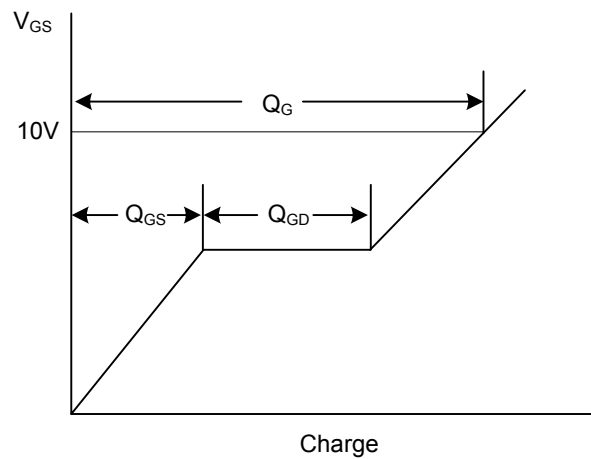
Switching Test Circuit



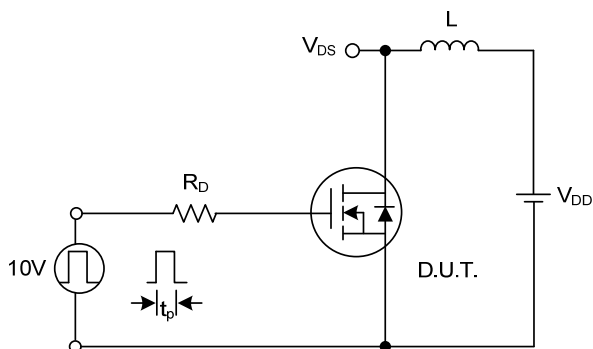
Switching Waveforms



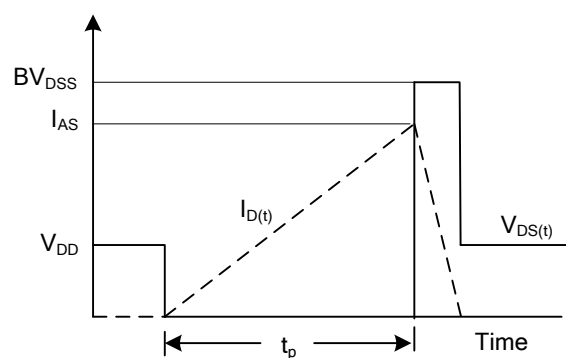
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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