



17N50K-MT

Preliminary

Power MOSFET

17A, 500V N-CHANNEL POWER MOSFET

DESCRIPTION

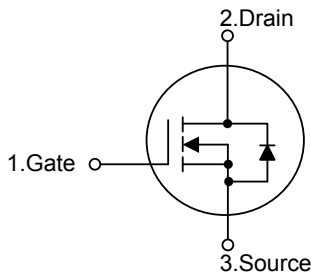
The UTC **17N50K-MT** is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology allows a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation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

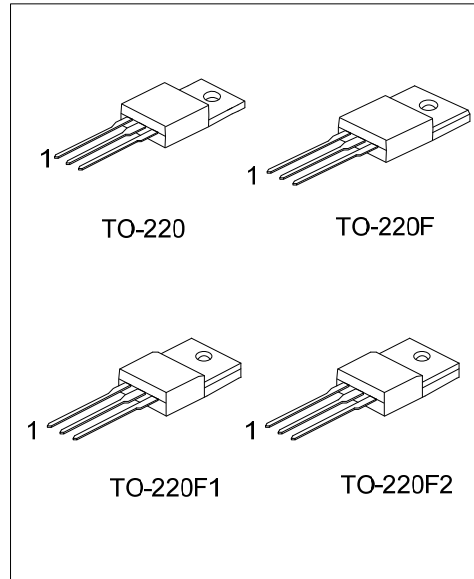


ORDERING INFORMATION

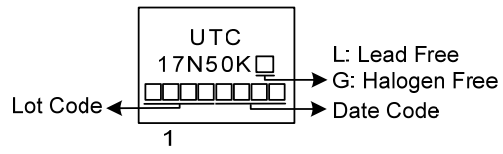
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
17N50KL-TA3-T	17N50KG-TA3-T	TO-220	G	D	S	Tube
17N50KL-TF1-T	17N50KG-TF1-T	TO-220F1	G	D	S	Tube
17N50KL-TF2-T	17N50KG-TF2-T	TO-220F2	G	D	S	Tube
17N50KL-TF3-T	17N50KG-TF3-T	TO-220F	G	D	S	Tube

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

<p>17N50KG-TA3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube</p> <p>(2) TA3: TO-220, TF3: TO-220F, TF1: TO-220F1, TF2: TO-220F2</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}	500	V	
Gate-Source Voltage		V_{GSS}	± 30	V	
Drain Current	Continuous $T_C=25^\circ\text{C}$	I_D	17	A	
	Pulsed (Note 2)	I_{DM}	68	A	
Avalanche Energy		Single Pulsed (Note 3)	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. $I_{SD} \leq 17\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

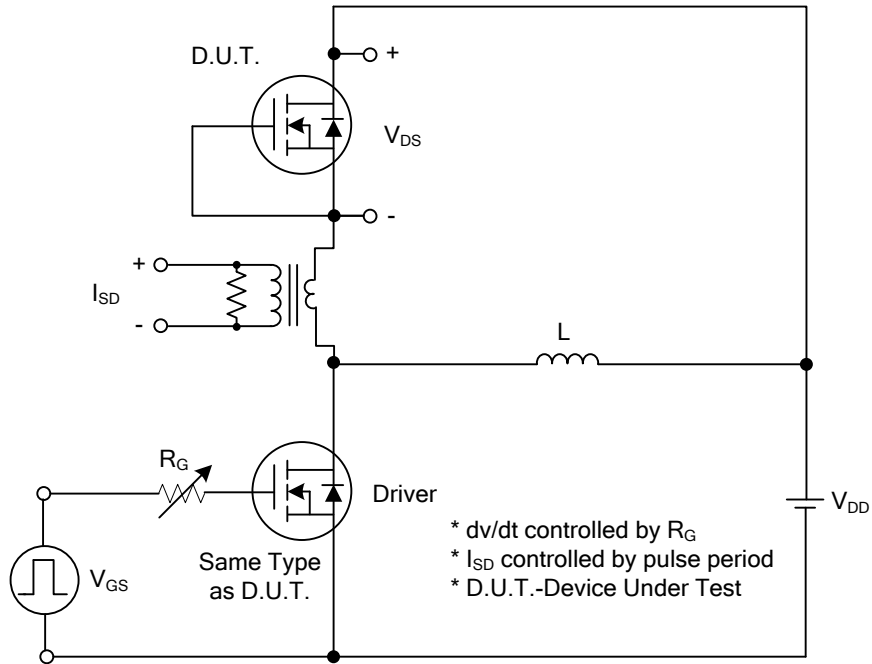
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
Junction to Case	TO-220	θ_{JC}	0.68	$^\circ\text{C}/\text{W}$
	TO-220F		2.91	$^\circ\text{C}/\text{W}$

■ ELECTRICAL CHARACTERISTICS

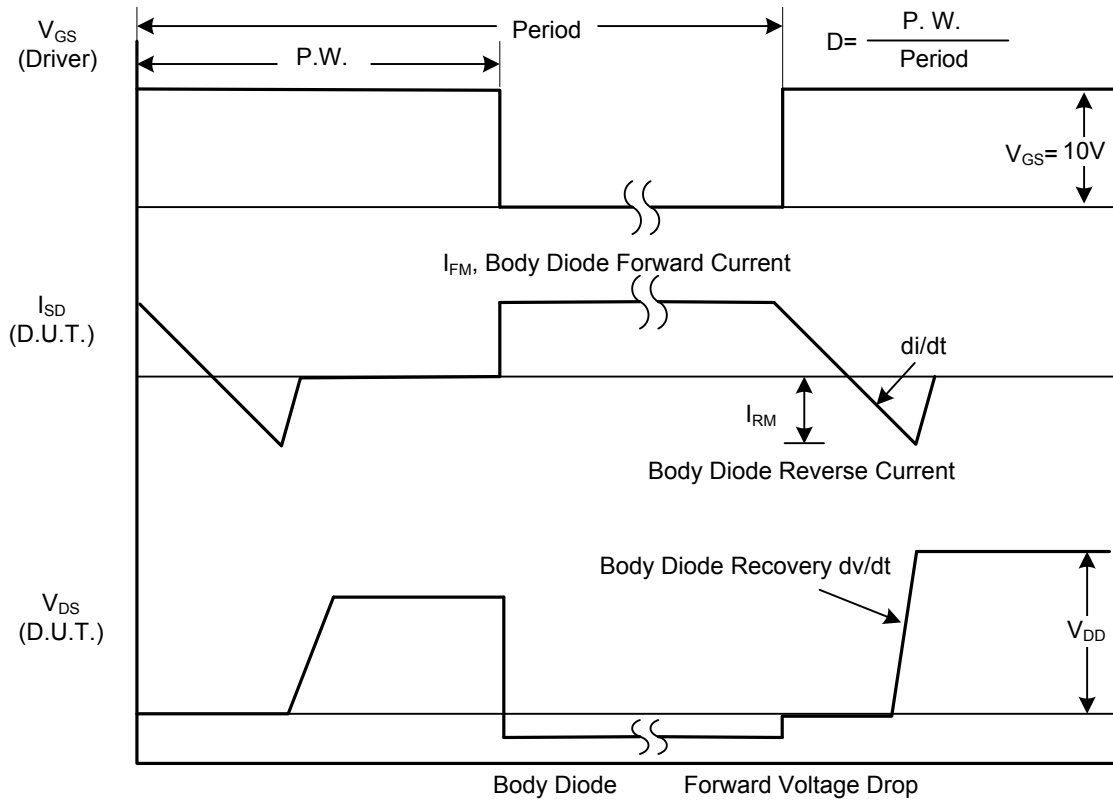
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	500			V
Breakdown Voltage Temperature Coefficient		$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C , $I_D=250\mu\text{A}$		0.5		$\text{V}/^\circ\text{C}$
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=500\text{V}$, $V_{GS}=0\text{V}$			10	μA
Gate- Source Leakage Current	Forward	I_{GSS}	$V_{GS}=+30\text{V}$, $V_{DS}=0\text{V}$			+100	nA
	Reverse		$V_{GS}=-30\text{V}$, $V_{DS}=0\text{V}$			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	2.0		4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=8.5\text{A}$		0.22	0.30	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$		2100		pF
Output Capacitance		C_{OSS}			290		pF
Reverse Transfer Capacitance		C_{RSS}			9		pF
SWITCHING PARAMETERS							
Total Gate Charge at 10V		$Q_{G(TOT)}$	$V_{GS}=10\text{V}$, $V_{DS}=50\text{V}$, $I_D=1.3\text{A}$ (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		$t_{D(ON)}$	$V_{DS}=30\text{V}$, $I_D=0.5\text{A}$, $R_G=25\Omega$ (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}	$I_{SD}=17\text{A}$, $V_{GS}=0\text{V}$			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

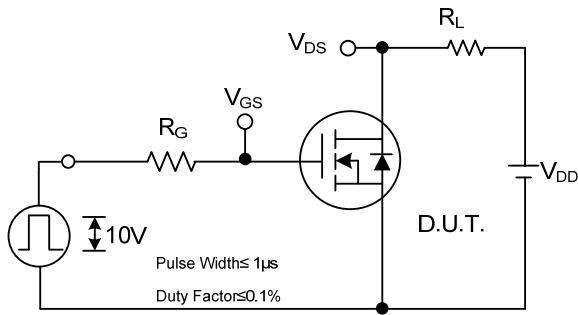


Peak Diode Recovery dv/dt Test Circuit

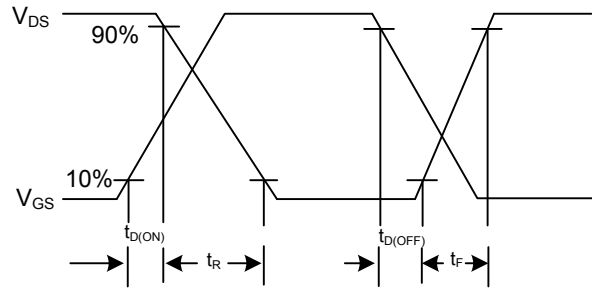


Peak Diode Recovery dv/dt Waveforms

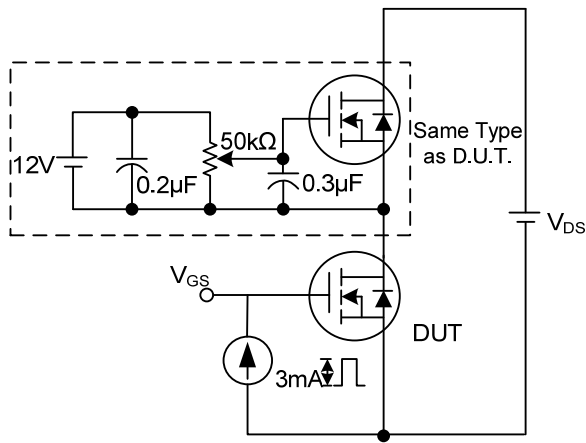
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



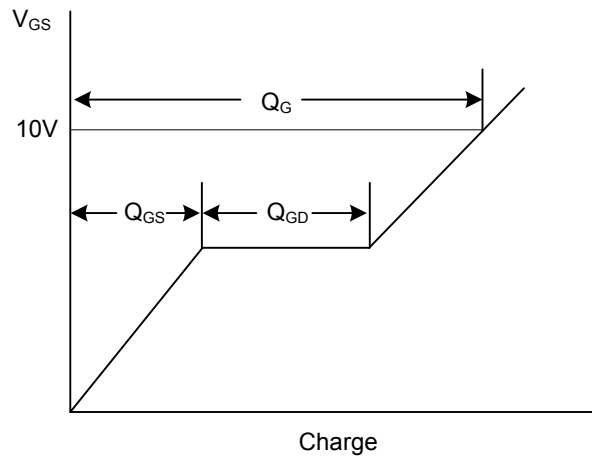
Switching Test Circuit



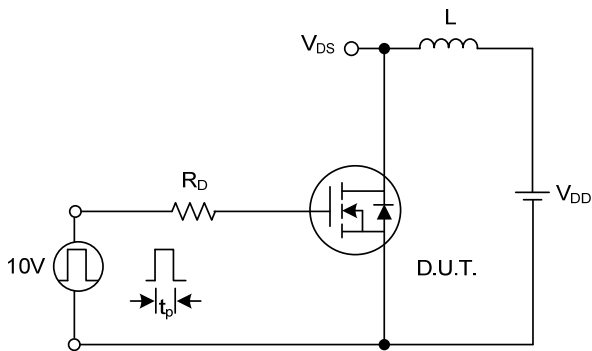
Switching Waveforms



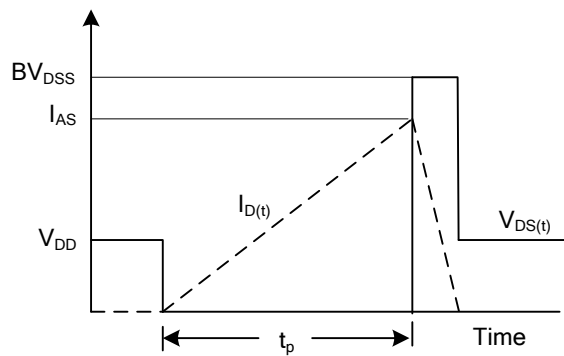
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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