

**18N60-HC**

Preliminary

Power MOSFET**18A, 600V N-CHANNEL
POWER MOSFET****DESCRIPTION**

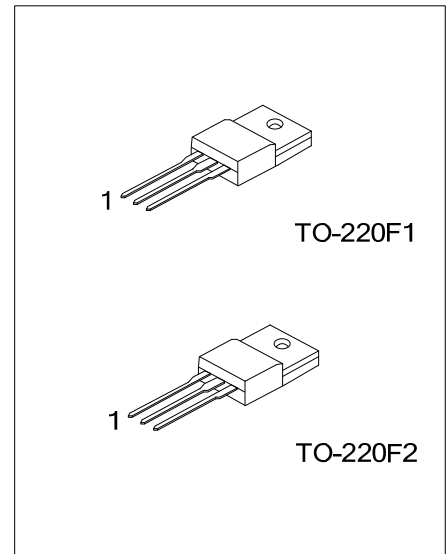
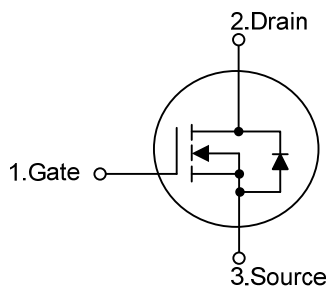
The UTC **18N60-HC** is a N-channel enhancement MOSFET using UTC's advanced technology to provide the customers with perfect $R_{DS(ON)}$, high switching speed, high current capacity and low gate charge.

The UTC **18N60-HC** is universally applied in low voltage such as automotive, high efficiency switching for AC/DC converters and DC motor control, etc.

FEATURES

* $R_{DS(ON)} \leq 0.45 \Omega$ @ $V_{GS}=10V$, $I_D=9.0A$

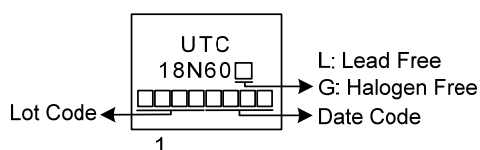
* High Switching Speed

SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
18N60L-TF1-T	18N60G-TF1-T	TO-220F1	G	D	S	Tube
18N60L-TF2-T	18N60G-TF2-T	TO-220F2	G	D	S	Tube

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

18N60G-TF1-T (1) Packing Type (2) Package Type (3) Green Package	(1) T: Tube (2) TF1: TO-220F1, TF2: TO-220F2 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

■ ABSOLUTE MAXIMUM RATINGS (unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DS}	600	V
Gate-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current	Continuous	I_D	18
	Pulsed	I_{DM}	36
Single Pulsed Avalanche Energy	E_{AS}	890	mJ
Peak Diode Recovery dv/dt (Note 4)	dv/dt	2.6	V/ns
Power Dissipation	P_D	48	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. $L=30\text{mH}$, $I_{AS}=7.7\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 18\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	θ_{JA}	62.5	°C/W
Junction to Case	θ_{JC}	2.6	°C/W

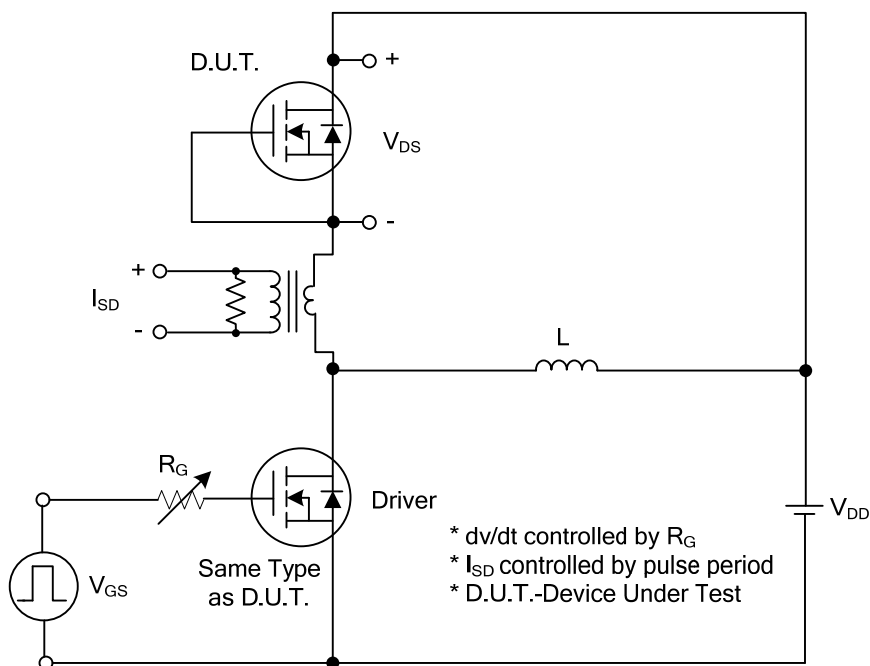
■ ELECTRICAL CHARACTERISTICS

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	600			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =600V, 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 =9.0A		0.37	0.45	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		2905		pF
Output Capacitance		C _{OSS}			260		pF
Reverse Transfer Capacitance		C _{RSS}			15		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =480V, V _{GS} =10V, I _D =18A I _G =1mA (Note 1, 2)		68		nC
Gate to Source Charge		Q _{GS}			17		nC
Gate to Drain Charge		Q _{GD}			20		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =100V, V _{GS} =10V, I _D =18A, R _G =25Ω (Note 1, 2)		38		ns
Rise Time		t _R			24		ns
Turn-OFF Delay Time		t _{D(OFF)}			182		ns
Fall-Time		t _F			54		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				18	A
Maximum Body-Diode Pulsed Current		I _{SM}				36	A
Drain-Source Diode Forward Voltage		V _{SD}	I _S =18A, V _{GS} =0V			1.4	V

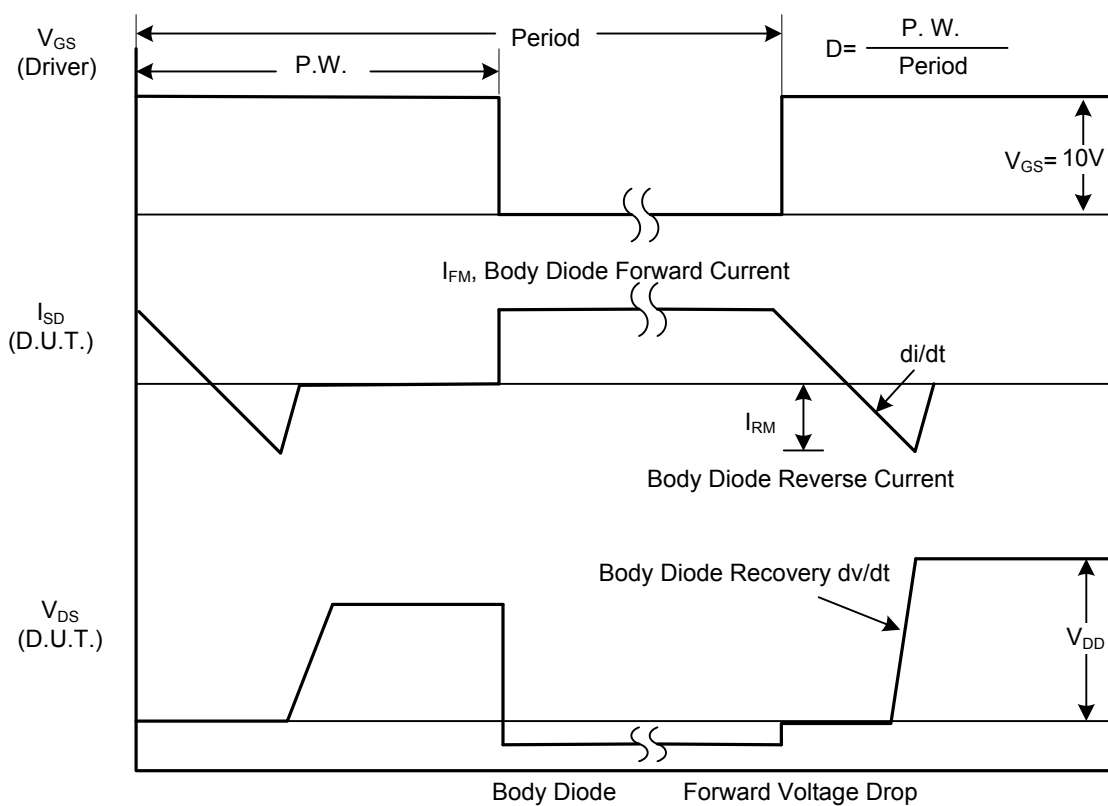
Notes: 1. Pulse Test: Pulse width $\leq 600\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

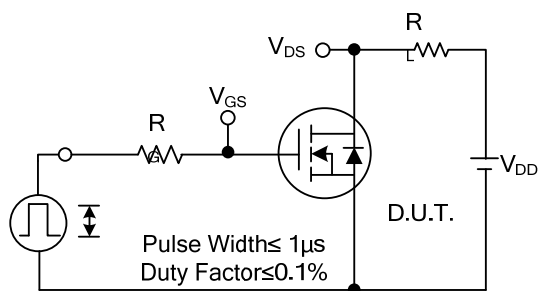


Peak Diode Recovery dv/dt Test Circuit

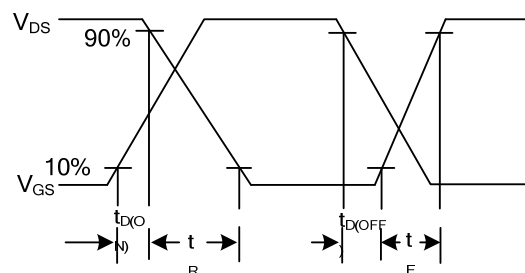


Peak Diode Recovery dv/dt Waveforms

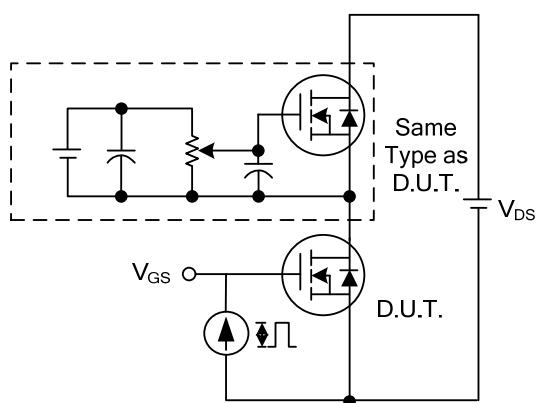
■ TEST CIRCUITS AND WAVEFORMS



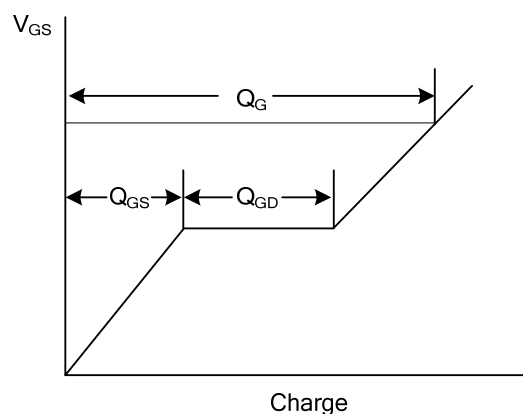
Switching Test Circuit



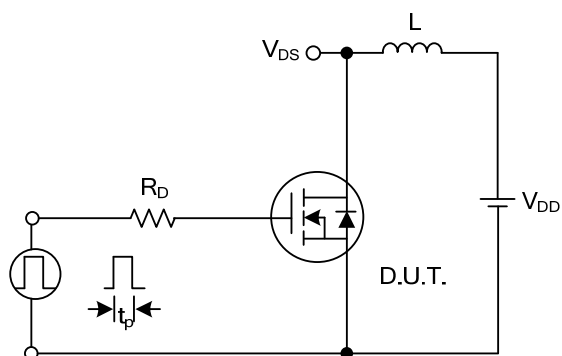
Switching Waveforms



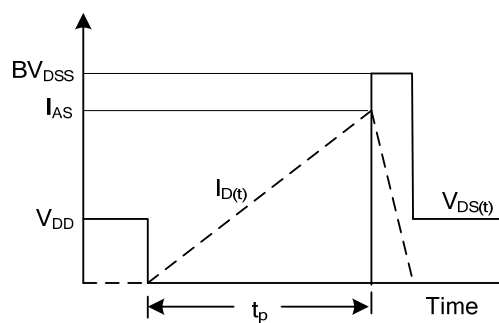
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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