

**UT70N15H**

Preliminary

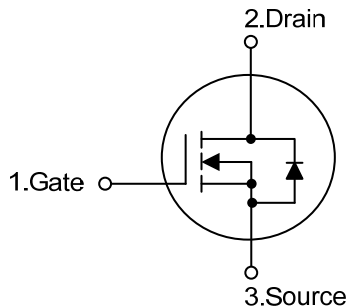
POWER MOSFET**70A, 150V N-CHANNEL
POWER MOSFET****DESCRIPTION**

The UTC **UT70N15H** is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance, low gate charge and high switching speed.

The UTC **UT70N15H** is suitable for high voltage synchronous rectifier and DC/DC converters, etc.

FEATURES

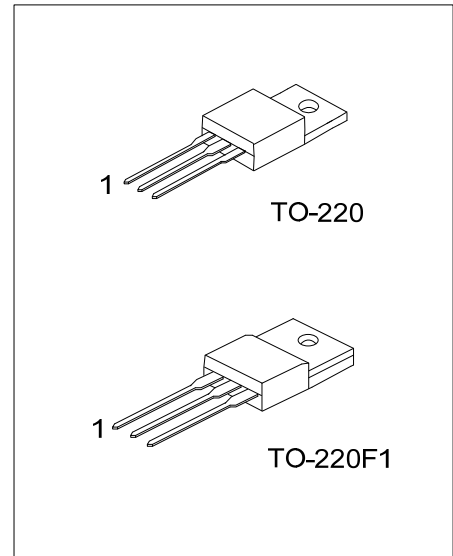
- * $R_{DS(ON)} \leq 19 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=35\text{A}$
- * High Switching Speed
- * High Cell Density Trench Technology

SYMBOL**ORDERING INFORMATION**

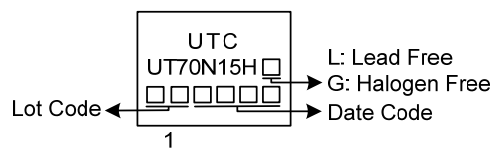
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT70N15HL-TA3-T	UT70N15HG-TA3-T	TO-220	G	D	S	Tube
UT70N15HL-TF1-T	UT70N15HG-TF1-T	TO-220F1	G	D	S	Tube

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

UT70N15HG-TA3-T (1) Packing Type (2) Package Type (3) Green Package	(1) T: Tube (2) TA3: TO-220, TF1: TO-220F1 (3) G: Halogen Free and Lead Free, L: Lead Free
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■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	150	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	Continuous	I_D	70	A
	Pulsed (Note 2)	I_{DM}	140	A
Avalanche Energy (Note 3)	Single Pulsed (Note 3)	E_{AS}	225	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	6.1	V/ns
Power Dissipation	TO-220	P_D	180	W
	TO-220F1		40	W
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature Range		T_{STG}	-70 ~ +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. $L = 0.1\text{mH}$, $I_{AS} = 21.2\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$

4. $I_{SD} \leq 30\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^{\circ}\text{C}$

■ **THERMAL DATA**

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ_{JA}	62.5	$^{\circ}\text{C}/\text{W}$
	TO-220F1			$^{\circ}\text{C}/\text{W}$
Junction to Case	TO-220	θ_{JC}	0.69	$^{\circ}\text{C}/\text{W}$
	TO-220F1		3.125	$^{\circ}\text{C}/\text{W}$

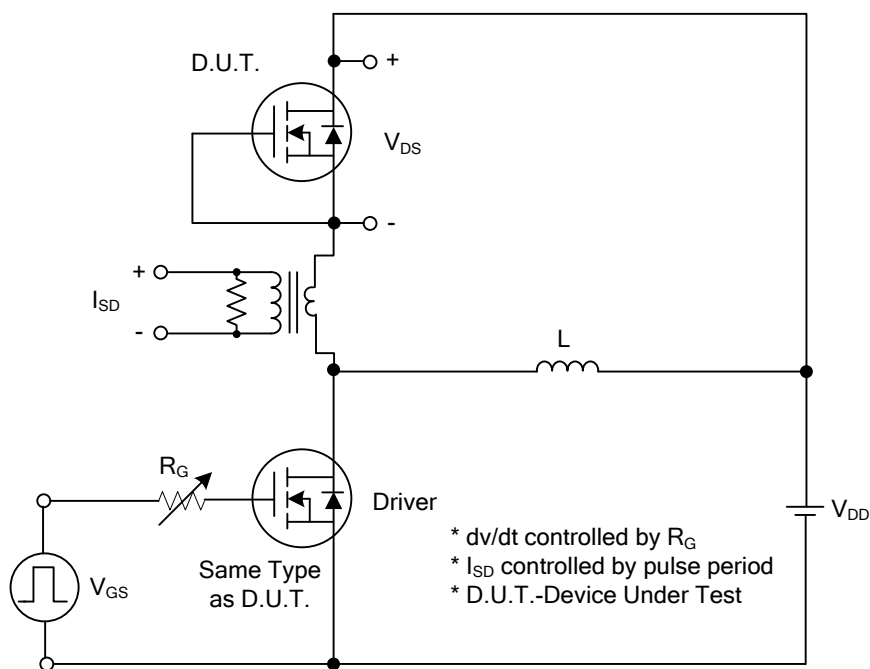
■ **ELECTRICAL CHARACTERISTICS** ($T_J = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	150			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =150V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-20V, 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 =35A			19	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		9038		pF
Output Capacitance		C _{OSS}			439		pF
Reverse Transfer Capacitance		C _{RSS}			366		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =100V, V _{GS} =10V, I _D =70A (Note 1, 2)		221		nC
Gate to Source Charge		Q _{GS}			45		nC
Gate to Drain Charge		Q _{GD}			98		nC
Turn-on Delay Time (Note 1)		t _{D(ON)}	V _{DS} =75V, V _{GS} =10V, I _D =70A, R _G =3Ω (Note 1, 2)		33		ns
Rise Time		t _R			24		ns
Turn-off Delay Time		t _{D(OFF)}			89		ns
Fall-Time		t _F			33		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				70	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =70A, V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time		t _{rr}	I _S =30A, V _{GS} =0V,		131		ns
Reverse Recovery Charge		Q _{rr}	dl _F /dt=100A/μs (Note 1)		631		nC

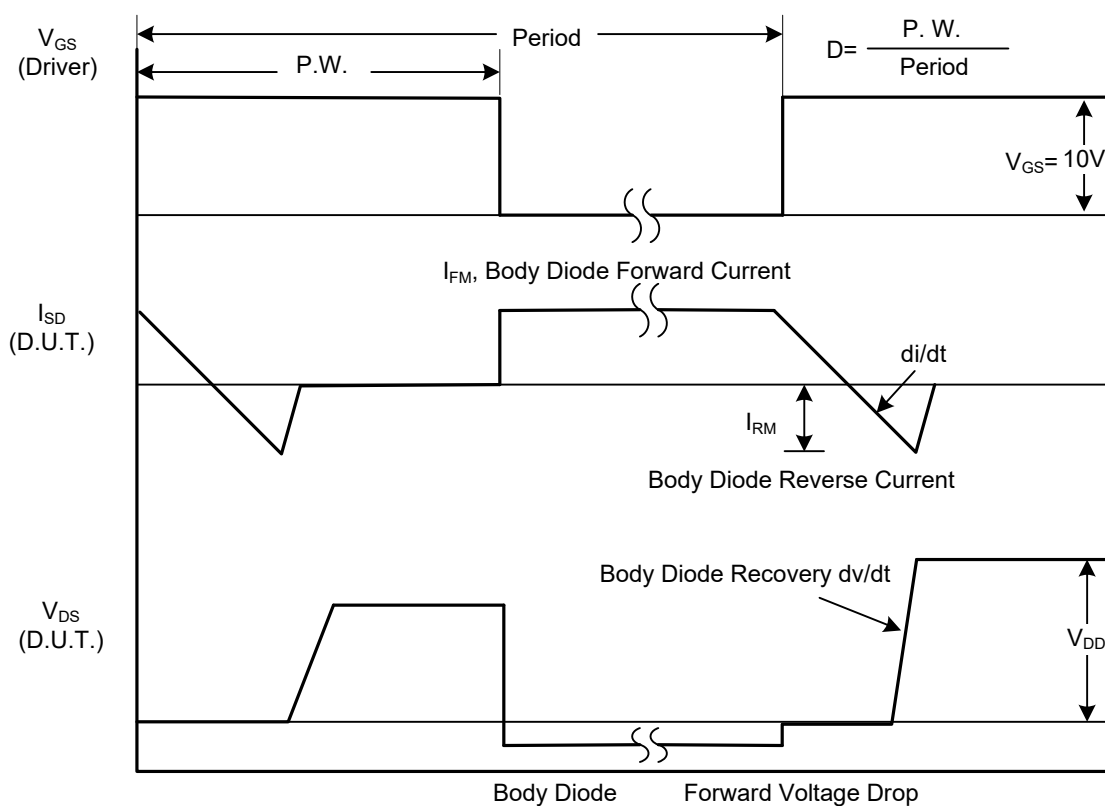
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

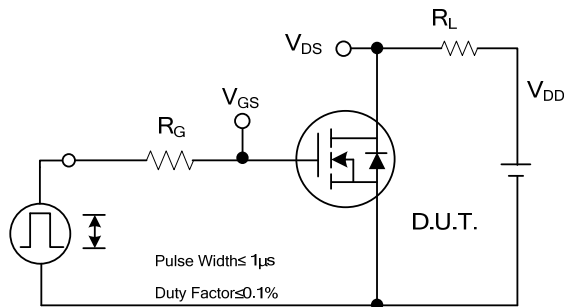


Peak Diode Recovery dv/dt Test Circuit

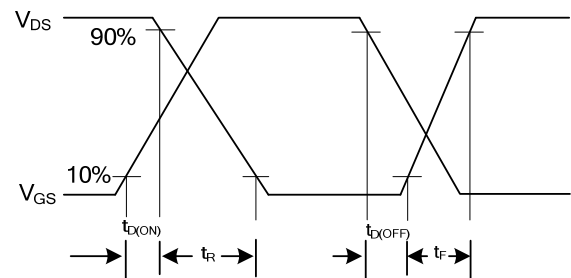


Peak Diode Recovery dv/dt Waveforms

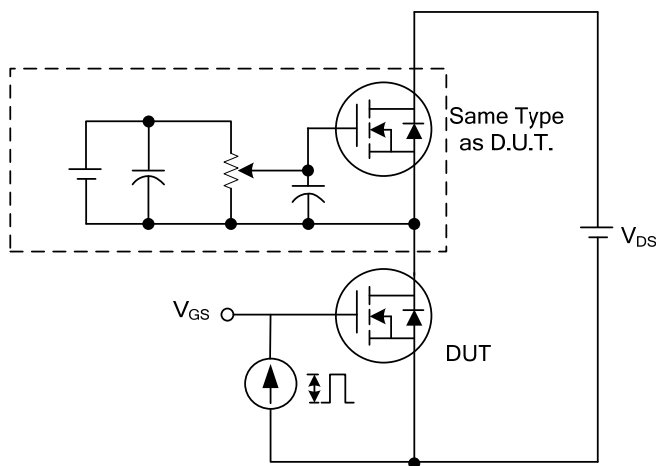
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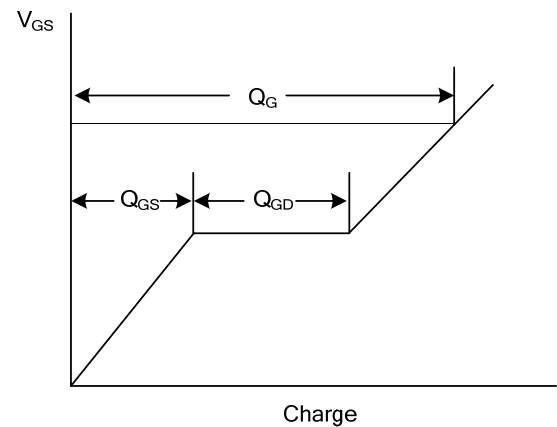
Switching Test Circuit



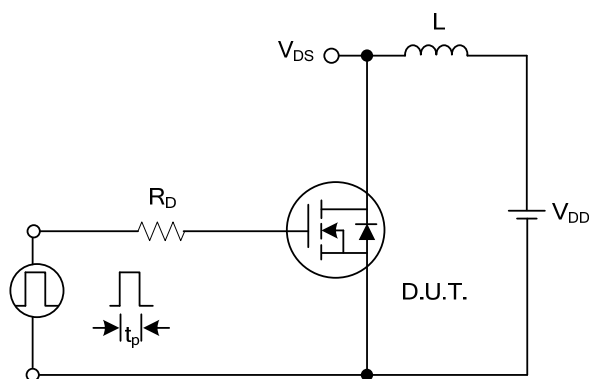
Switching Waveforms



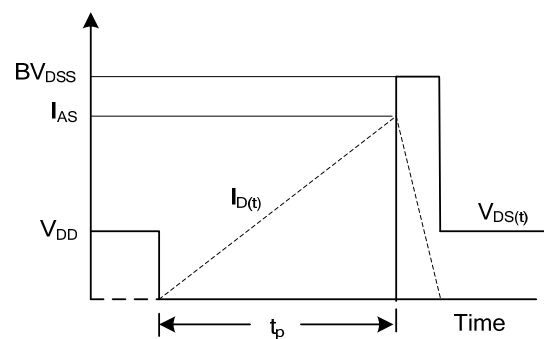
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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