



15N15-HC

Preliminary

Power MOSFET

15A, 150V N-CHANNEL POWER MOSFET

DESCRIPTION

The UTC **15N15-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.

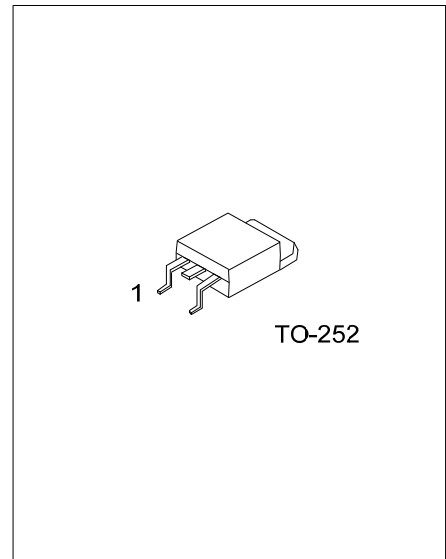
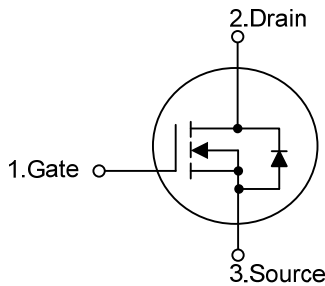
The UTC **15N15-HC** is universally applied in low voltage such as automotive, high efficiency switching for AC/DC converters and DC motor control, etc.

FEATURES

* $R_{DS(ON)} \leq 0.2 \Omega @ V_{GS}=10V, I_D=7.5A$

* High Switching Speed

SYMBOL



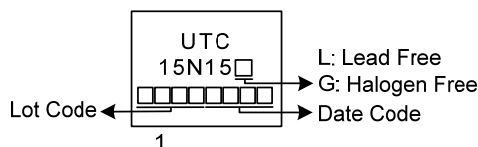
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
15N15L-TN3-R	15N15G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>15N15G-TN3-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) TN3: TO-252</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}	150	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current	Continuous	I_D	15
	Pulsed	I_{DM}	30
Single Pulsed Avalanche Current	I_{AS}	19.2	A
Single Pulsed Avalanche Energy	E_{AS}	18.6	mJ
Peak Diode Recovery dv/dt (Note 4)	dv/dt	2.3	V/ns
Power Dissipation	P_D	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. $L=0.1\text{mH}$, $I_{AS}=19.2\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 15\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	θ_{JA}	110	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	2.31 (Note)	$^\circ\text{C}/\text{W}$

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

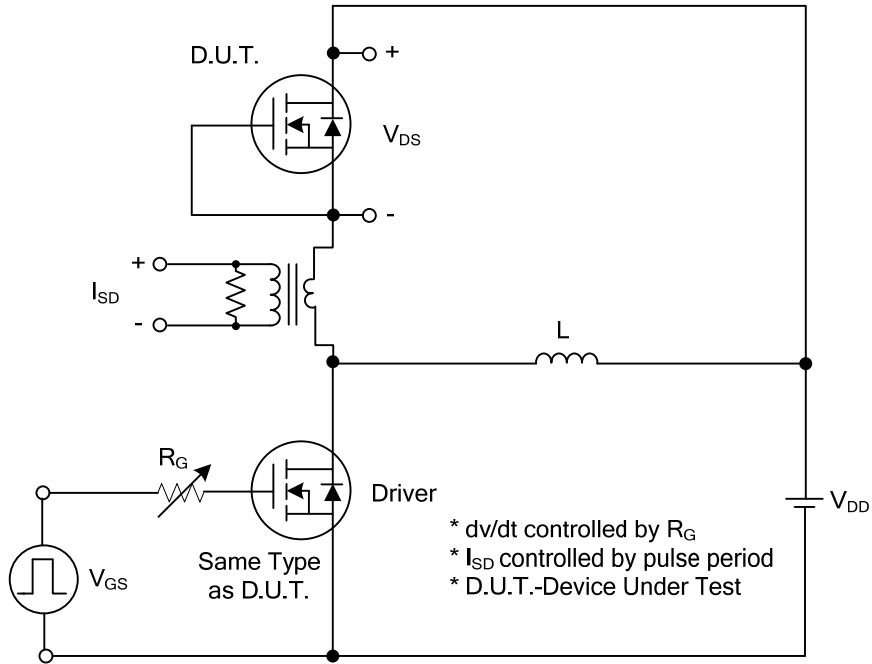
■ ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	150			V	
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=150V, V_{GS}=0V$			10	μA	
Gate-Source Leakage Current	Forward	$V_{GS}=+20V, V_{DS}=0V$			+100	nA	
	Reverse	$V_{GS}=-20V, V_{DS}=0V$			-100	nA	
ON CHARACTERISTICS							
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0		4.0	V	
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=7.5A$			0.2	Ω	
DYNAMIC PARAMETERS							
Input Capacitance	C_{ISS}	$V_{GS}=0V, V_{DS}=25V, f=1.0MHz$		419.3		pF	
Output Capacitance	C_{OSS}				96.5		pF
Reverse Transfer Capacitance	C_{RSS}				7.1		pF
SWITCHING PARAMETERS							
Total Gate Charge	Q_G	$V_{DS}=120V, V_{GS}=10V, I_D=15A$ $I_G=1mA$ (Note 1, 2)		14.8		nC	
Gate to Source Charge	Q_{GS}				5.4		nC
Gate to Drain Charge	Q_{GD}				2.8		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=100V, V_{GS}=10V, I_D=15A,$ $R_G=25\Omega$ (Note 1, 2)		5.6		ns	
Rise Time	t_R				16.7		ns
Turn-OFF Delay Time	$t_{D(OFF)}$				22.6		ns
Fall-Time	t_F				19.1		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current	I_S				15	A	
Maximum Body-Diode Pulsed Current	I_{SM}				30	A	
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=15A, V_{GS}=0V$			1.4	V	
Body Diode Reverse Recovery Time	t_{rr}	$I_S=15A, V_{GS}=0V, dI_F/dt=100A/\mu s$ (Note 1)		105.6		ns	
Reverse Recovery Charge	Q_{rr}				0.6		μC

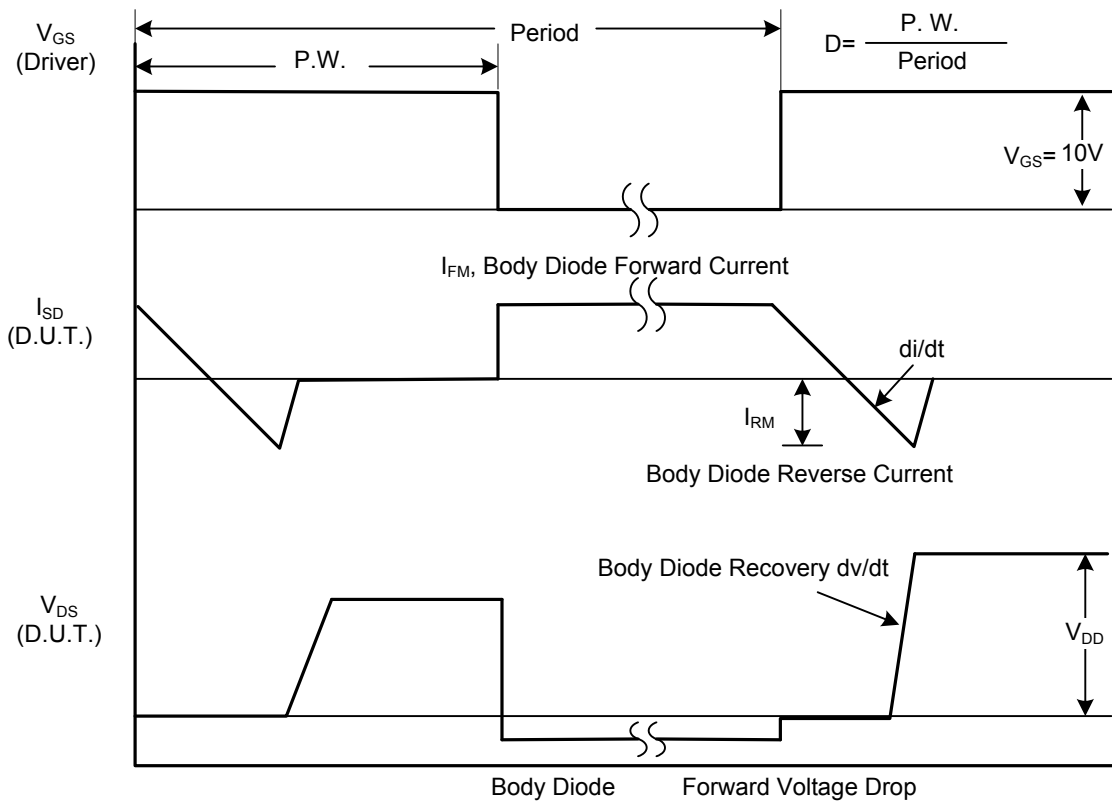
Notes: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

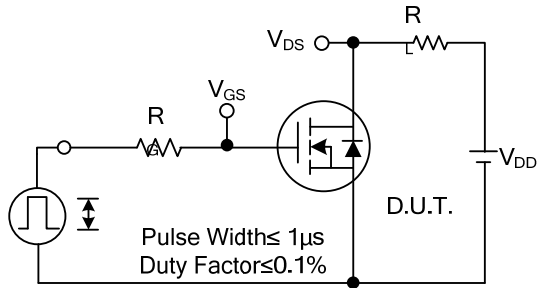


Peak Diode Recovery dv/dt Test Circuit

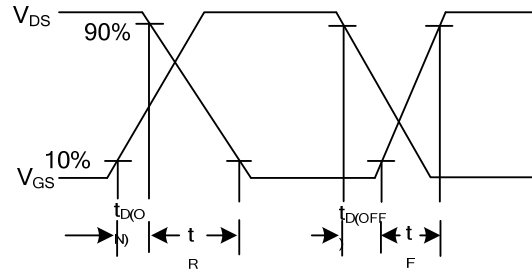


Peak Diode Recovery dv/dt Waveforms

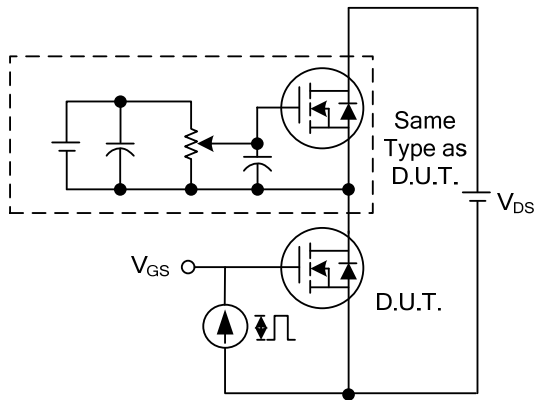
■ TEST CIRCUITS AND WAVEFORMS



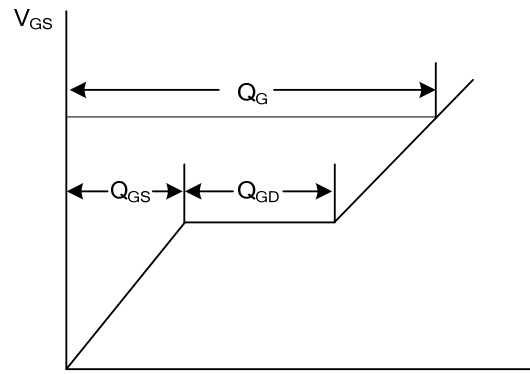
Switching Test Circuit



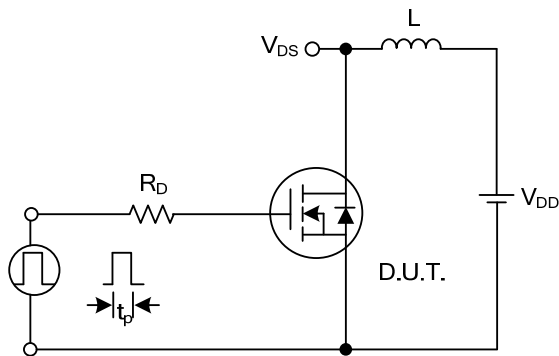
Switching Waveforms



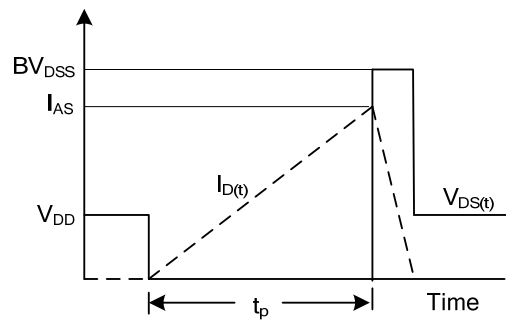
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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