



## 30N15-HC

Preliminary

Power MOSFET

## 30A, 150V N-CHANNEL POWER MOSFET

### DESCRIPTION

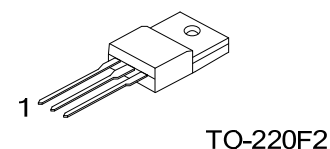
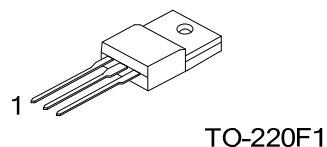
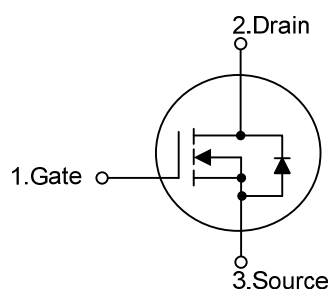
The UTC **30N15-HC** is a N-channel enhancement MOSFET using UTC's advanced technology to provide the customers with perfect  $R_{DS(ON)}$ , high switching speed, high current capacity and low gate charge.

The UTC **30N15-HC** is universally applied in low voltage such as automotive, high efficiency switching for AC/DC converters and DC motor control, etc.

### FEATURES

- \*  $R_{DS(ON)} \leq 80 \text{ m}\Omega$  @  $V_{GS}=10\text{V}$ ,  $I_D=15\text{A}$
- \* High Switching Speed

### SYMBOL



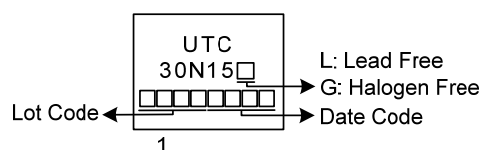
### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
30N15L-TF1-T	30N15G-TF1-T	TO-220F1	G	D	S	Tube
30N15L-TF2-T	30N15G-TF2-T	TO-220F2	G	D	S	Tube

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

<p>30N15G-TF1-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube</p> <p>(2) 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 (unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		$V_{DS}$	150	V
Gate-Source Voltage		$V_{GS}$	$\pm 30$	V
Continuous Drain Current	Continuous	$I_D$	30	A
	Pulsed	$I_{DM}$	60	A
Single Pulsed Avalanche Current		$I_{AS}$	29.8	A
Single Pulsed Avalanche Energy		$E_{AS}$	89.1	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	3.4	V/ns
Power Dissipation		$P_D$	42.5	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.  $L=0.1\text{mH}$ ,  $I_{AS}=29.8\text{A}$ ,  $V_{DD}=50\text{V}$ ,  $R_G=25\Omega$ , Starting  $T_J = 25^\circ\text{C}$

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

■ THERMAL DATA

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	$\theta_{JA}$	62.5	°C/W
Junction to Case	$\theta_{JC}$	2.9	°C/W

■

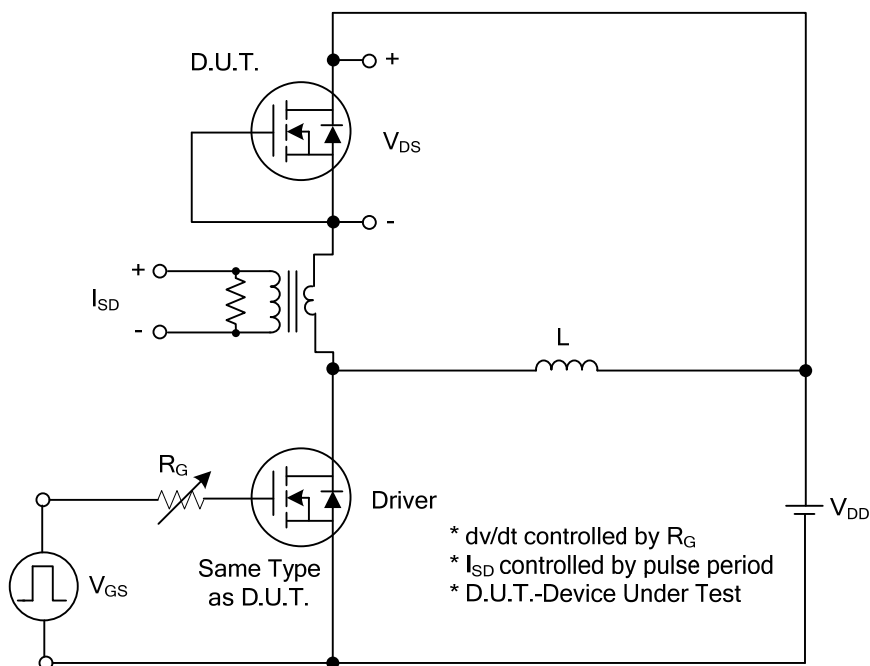
## ■ ELECTRICAL CHARACTERISTICS

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV <sub>DSS</sub>	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	150			V
Drain-Source Leakage Current		I <sub>DSS</sub>	V <sub>DS</sub> =150V, V <sub>GS</sub> =0V			10	μA
Gate-Source Leakage Current	Forward	I <sub>GSS</sub>	V <sub>GS</sub> =+30V, V <sub>DS</sub> =0V			+100	nA
	Reverse		V <sub>GS</sub> =-30V, V <sub>DS</sub> =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance		R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =15A			80	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1.0MHz		993.4		pF
Output Capacitance		C <sub>OSS</sub>			214.7		pF
Reverse Transfer Capacitance		C <sub>RSS</sub>			13.5		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q <sub>G</sub>	V <sub>DS</sub> =120V, V <sub>GS</sub> =10V, I <sub>D</sub> =30A I <sub>G</sub> =1mA (Note 1, 2)		28.7		nC
Gate to Source Charge		Q <sub>GS</sub>			11.4		nC
Gate to Drain Charge		Q <sub>GD</sub>			7.4		nC
Turn-ON Delay Time		t <sub>D(ON)</sub>	V <sub>DD</sub> =100V, V <sub>GS</sub> =10V, I <sub>D</sub> =30A, R <sub>G</sub> =6.0Ω (Note 1, 2)		7.6		ns
Rise Time		t <sub>R</sub>			16.8		ns
Turn-OFF Delay Time		t <sub>D(OFF)</sub>			18.1		ns
Fall-Time		t <sub>F</sub>			17.2		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I <sub>S</sub>				30	A
Maximum Body-Diode Pulsed Current		I <sub>SM</sub>				60	A
Drain-Source Diode Forward Voltage		V <sub>SD</sub>	I <sub>S</sub> =30A, V <sub>GS</sub> =0V			1.4	V
Body Diode Reverse Recovery Time		t <sub>rr</sub>	I <sub>S</sub> =30A, V <sub>GS</sub> =0V, dI <sub>F</sub> /dt=100A/μs		98.6		ns
Reverse Recovery Charge		Q <sub>rr</sub>	(Note 1)		0.7		μC

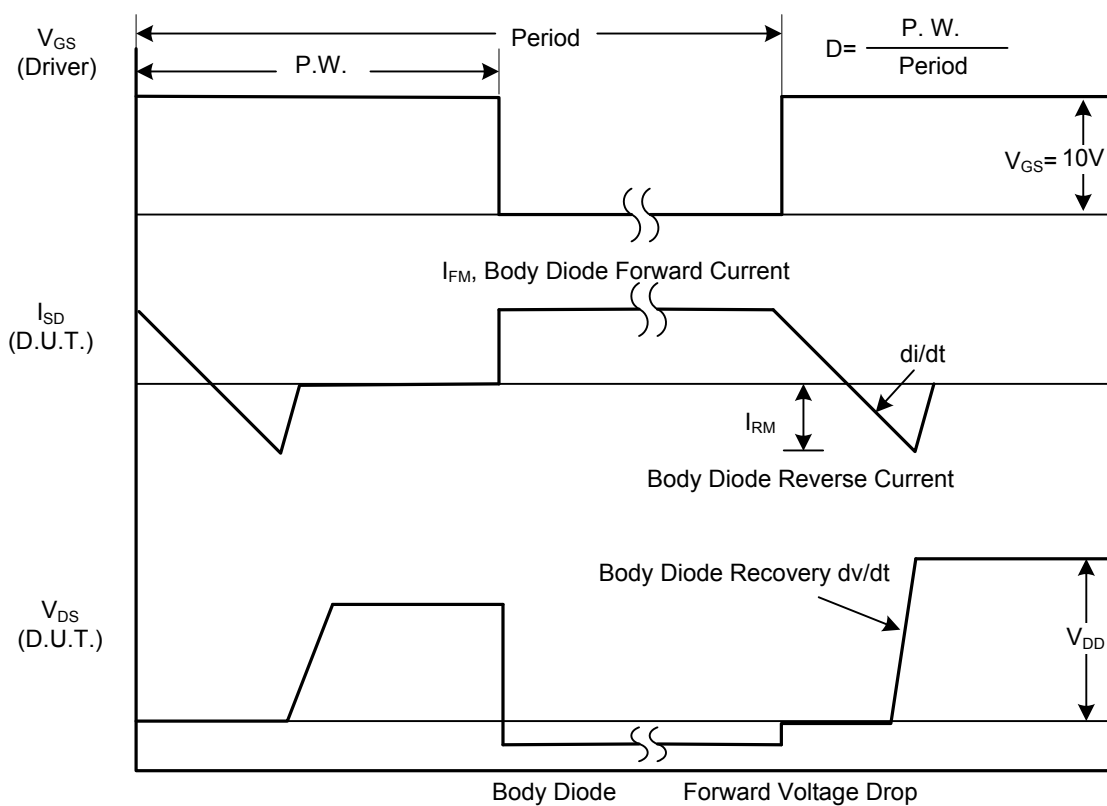
Notes: 1. Pulse Test: Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .

2. Essentially independent of operating temperature.

# ■ TEST CIRCUITS AND WAVEFORMS

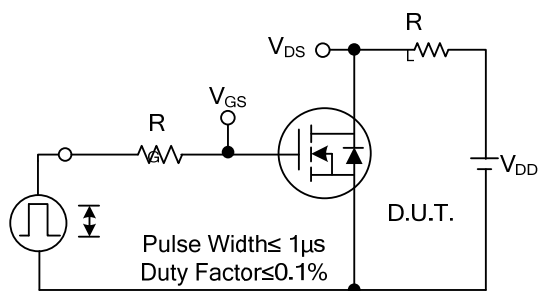


Peak Diode Recovery dv/dt Test Circuit

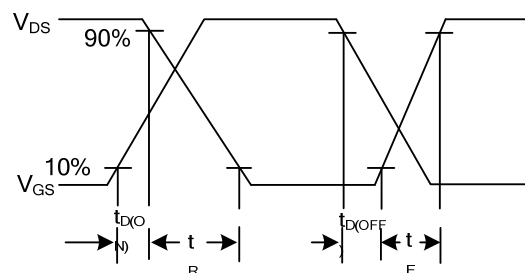


Peak Diode Recovery dv/dt Waveforms

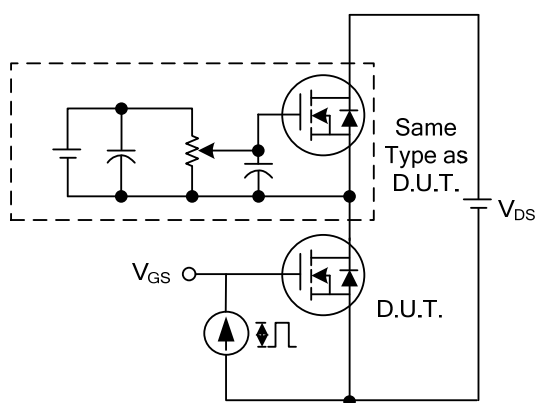
# ■ TEST CIRCUITS AND WAVEFORMS



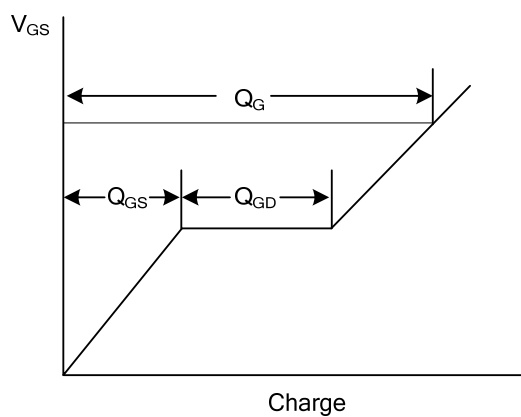
Switching Test Circuit



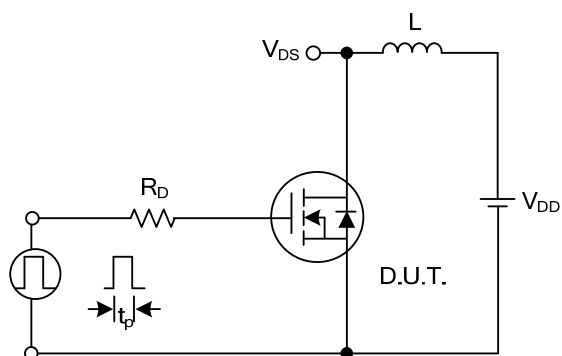
Switching Waveforms



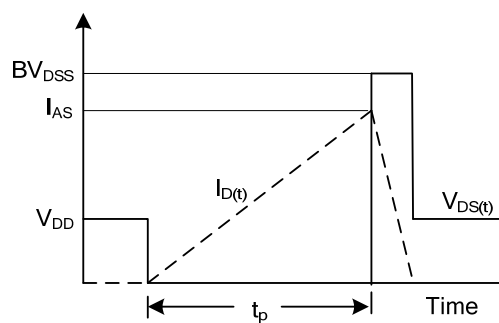
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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