



UTT4N15-F

Preliminary

Power MOSFET

4.0A, 150V N-CHANNEL POWER MOSFET

DESCRIPTION

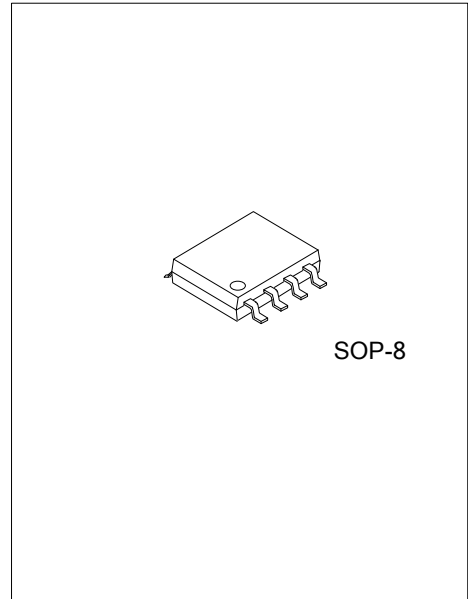
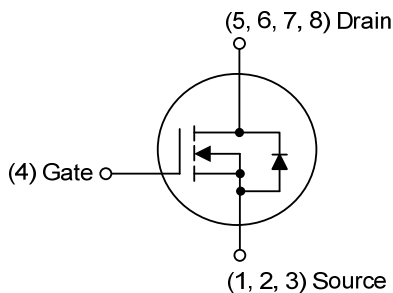
UTC **UTT4N15-F** is a N-Channel enhancement mode power field effect transistors are using trench DMOS technology.

This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

FEATURES

- * $R_{DS(ON)} < 65\text{ m}\Omega @ V_{GS}=10V, I_D=4.0A$
- * $R_{DS(ON)} < 85\text{ m}\Omega @ V_{GS}=6.0V, I_D=2.0A$
- * Improved dv/dt capability
- * Fast switching

SYMBOL



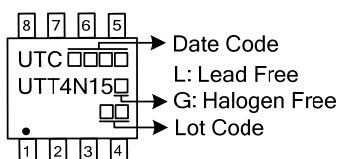
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT4N15L-S08-R	UTT4N15G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UTT4N15G-S08-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) S08: SOP-8</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}	± 25	V
Drain Current	Continuous	I_D	4.0	A
	Pulsed (Note 2)	I_{DM}	16	A
Power Dissipation		P_D	2.5	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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	50	$^\circ\text{C}/\text{W}$

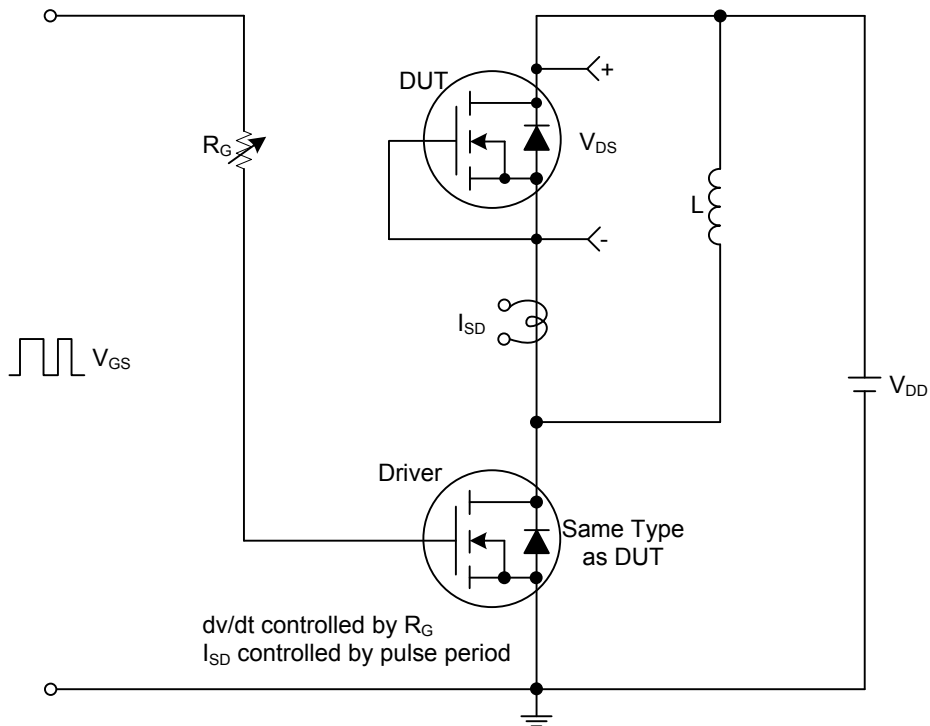
■ ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	150			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=150\text{V}, V_{GS}=0\text{V}$			1	μA
Gate-Source Leakage Current	Forward Reverse	I_{GSS}	$V_{GS}=+25\text{V}, V_{DS}=0\text{V}$		+100	nA
			$V_{GS}=-25\text{V}, V_{DS}=0\text{V}$		-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	$R_{DS(ON)}$	$V_{GS}=10\text{V}, I_D=4.0\text{A}$		52	65	m Ω
		$V_{GS}=6.0\text{V}, I_D=2.0\text{A}$		60	85	m Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}, V_{DS}=25\text{V}, f=1.0\text{MHz}$		1790	3000	pF
Output Capacitance	C_{OSS}			160	300	pF
Reverse Transfer Capacitance	C_{RSS}			82	150	pF
SWITCHING PARAMETERS						
Total Gate Charge (Note 1)	Q_G	$V_{DS}=75\text{V}, V_{GS}=10\text{V}, I_D=4.0\text{A}$		30	60	nC
Gate to Source Charge	Q_{GS}			8.7	16	nC
Gate to Drain Charge	Q_{GD}			8.0	16	nC
Turn-on Delay Time (Note 1)	$t_{D(ON)}$	$V_{DS}=75\text{V}, V_{GS}=10\text{V}, I_D=6.0\text{A}, R_G=1.0\Omega$		14.5	28	ns
Rise Time	t_R			19.2	18	ns
Turn-off Delay Time	$t_{D(OFF)}$			33.6	60	ns
Fall-Time	t_F			22.8	25	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				4.0	A
Maximum Body-Diode Pulsed Current	I_{SM}				8.0	A
Drain-Source Diode Forward Voltage (Note 1)	V_{SD}	$I_S=1.0\text{A}, V_{GS}=0\text{V}$			1.0	V

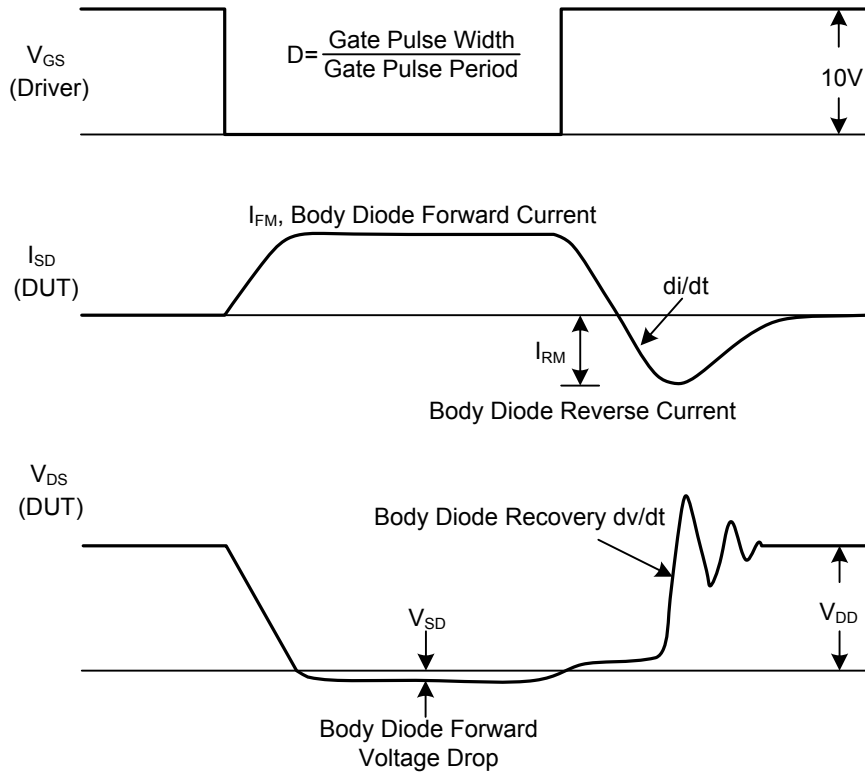
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



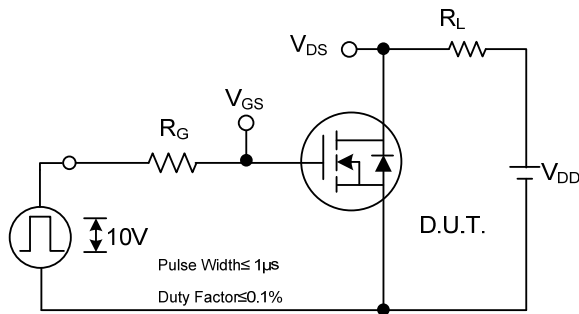
Peak Diode Recovery dv/dt Test Circuit



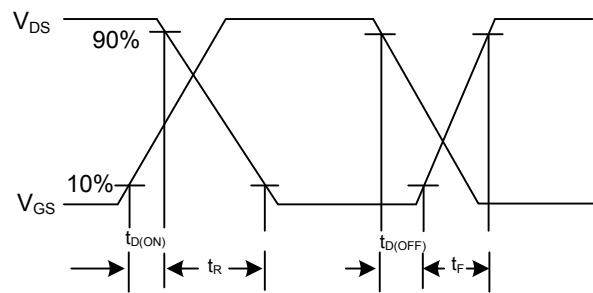
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

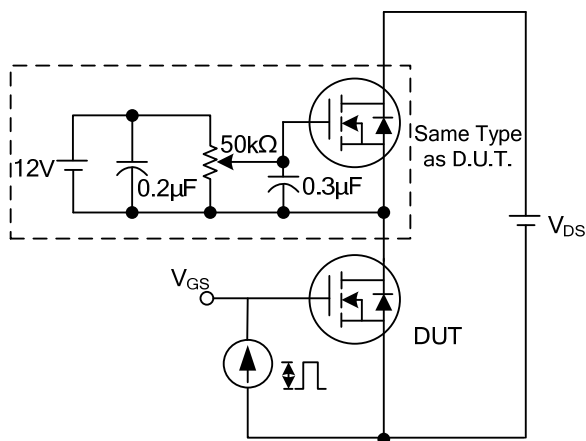
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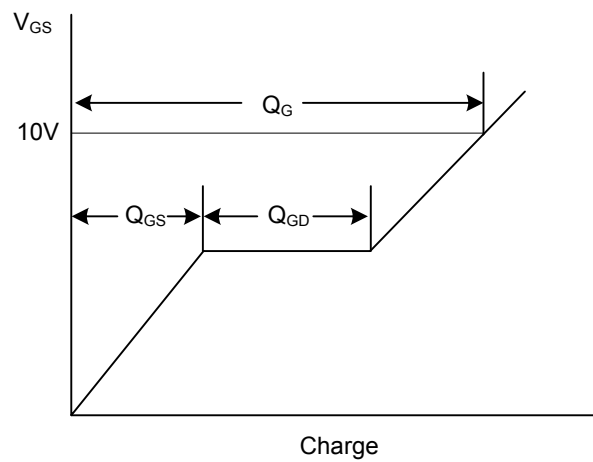
Switching Test Circuit



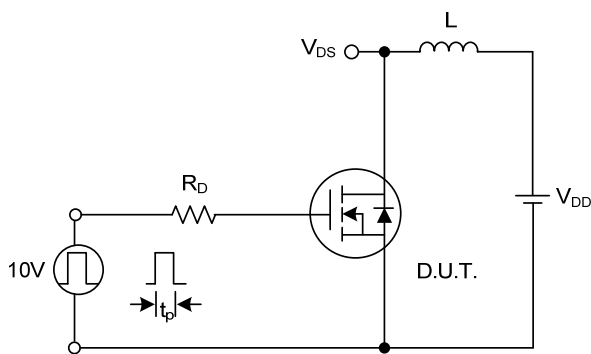
Switching Waveforms



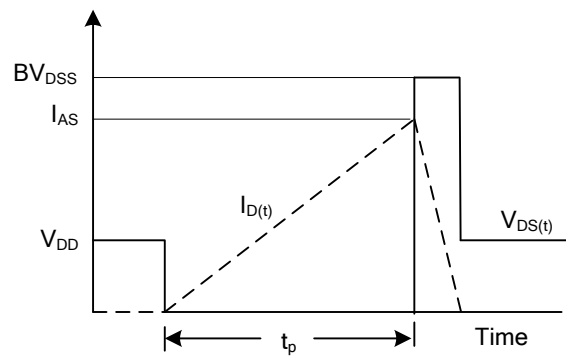
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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