

**UTT7115**

Preliminary

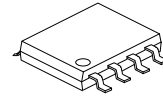
Power MOSFET

**-8.9A, -150V P-CHANNEL
POWER MOSFET****■ DESCRIPTION**

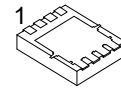
The **UTT7115** is a P-channel power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance and superior switching performance.

■ FEATURES

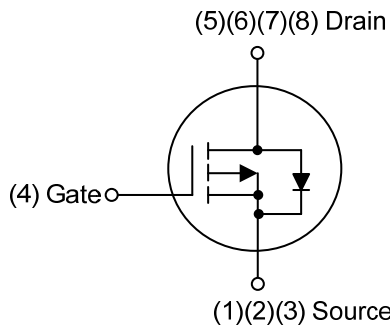
- * $R_{DS(ON)} \leq 269 \text{ m}\Omega$ @ $V_{GS} = -10\text{V}$, $I_D = -4.0\text{A}$
- * $R_{DS(ON)} \leq 280 \text{ m}\Omega$ @ $V_{GS} = -6.0\text{V}$, $I_D = -3.0\text{A}$
- * Low capacitance
- * Low gate charge
- * Fast switching capability
- * Avalanche energy specified



SOP-8



PDFN5×6

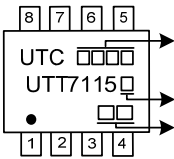
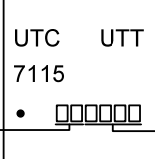
■ SYMBOL**■ ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT7115L-S08-R	UTT7115G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UTT7115L-P5060-R	UTT7115G-P5060-R	PDFN5×6	S	S	S	G	D	D	D	D	Tape Reel

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

UTT7115G-S08-R		(1) Packing Type	(1) R: Tape Reel
		(2) Package Type	(2) S08: SOP-8, P5060: PDFN5×6
		(3) Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

SOP-8	PDFN5×6
 UTC □□□□ → Date Code UTT7115 □ → L: Lead Free □ → G: Halogen Free • □□ → Lot Code	 UTC UTT 7115 • □□□□□□ → Date Code Lot Code ←

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	-150	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current		I_D	-8.9	A
Pulsed Drain Current (Note 2)		I_{DM}	-15	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	28.5	mJ
Peak Diode Recovery dv/dt		dv/dt	6.8	V/ns
Power Dissipation	SOP-8	P_D	2.5	W
	PDFN5×6		11	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. $L = 0.1\text{mH}$, $I_{AS} = -23.9\text{A}$, $V_{DD} = -30\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$

4. $I_{SD} \leq -8.9\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DS}$, Starting $T_J = 25^{\circ}\text{C}$

■ **THERMAL DATA**

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOP-8	θ_{JA}	90	$^{\circ}\text{C}/\text{W}$
	PDFN5×6		83	$^{\circ}\text{C}/\text{W}$
Junction to Case	SOP-8	θ_{JC}	11.36	$^{\circ}\text{C}/\text{W}$
	PDFN5×6		4.46	$^{\circ}\text{C}/\text{W}$

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

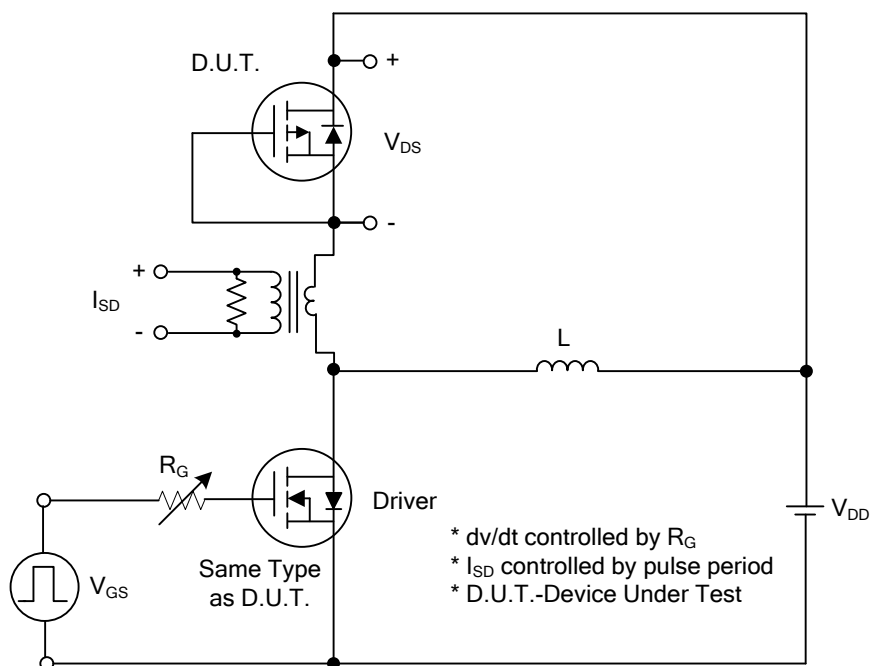
■ **ELECTRICAL CHARACTERISTICS** ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250μA	-150			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-150V, V _{GS} =0V			-1	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _{DS} =-250μA	-2.0		-4.0	V
Static Drain-Source On-Resistance (Note)	R _{DS(ON)}	V _{GS} =-10V, I _D =-4.0A			269	mΩ
		V _{GS} =-6.0V, I _D =-3.0A			280	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =-25V, V _{GS} =0V, f=1.0MHz		2405		pF
Output Capacitance	C _{OSS}			111		pF
Reverse Transfer Capacitance	C _{RSS}			93.4		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note 1)	Q _G	V _{DS} =-75V, V _{GS} =-10V, I _D =-3.0A (Note 1, 2)		41.3		nC
Gate Source Charge	Q _{GS}			16.6		nC
Gate Drain Charge	Q _{GD}			16.4		nC
Turn-ON Delay Time (Note 1)	t _{D(ON)}	V _{DS} =-75V, V _{GS} =-10V, I _D =-3.0A R _G =3Ω (Note 1, 2)		12.8		ns
Turn-ON Rise Time	t _R			16.6		ns
Turn-OFF Delay Time	t _{D(OFF)}			47.2		ns
Turn-OFF Fall-Time	t _F			22.2		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				-8.9	A
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}				-15	A
Diode Forward Voltage	V _{SD}	I _S =-3.0A, V _{GS} =0V			-1.4	V
Body Diode Reverse Recovery Time	t _{rr}	I _S =-8.9A, V _{GS} =0V,		96		ns
Body Diode Reverse Recovery Charge	Q _{rr}	di/dt=100A/μs		346.8		nC

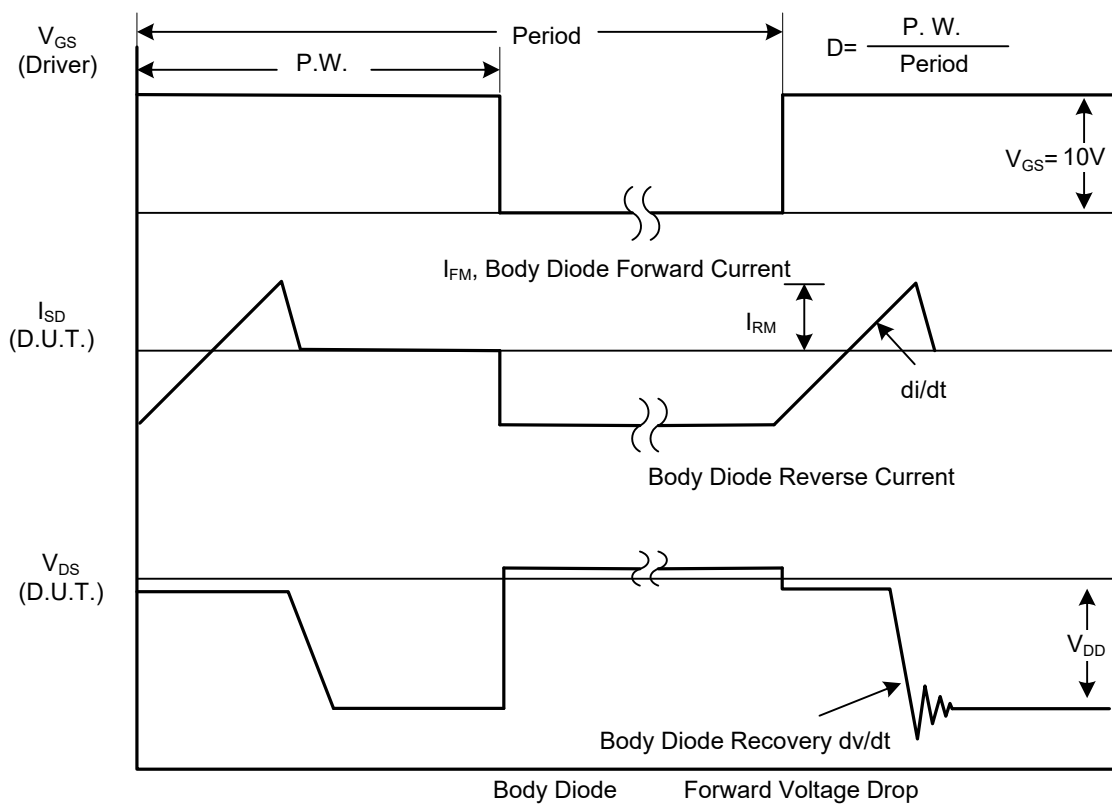
Notes: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

2. Essentially independent of operating temperature typical characteristics.

■ TEST CIRCUITS AND WAVEFORMS

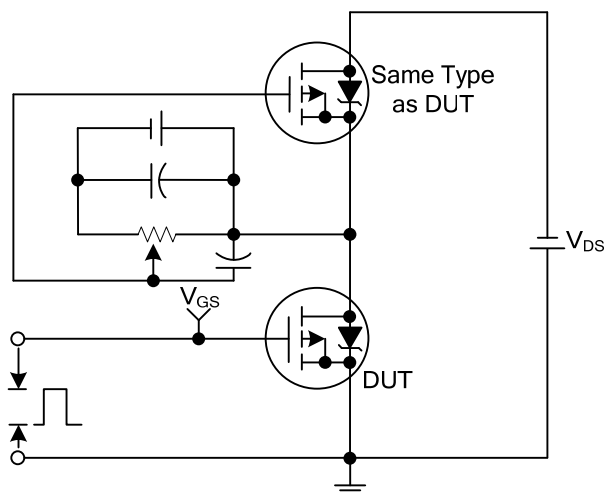


Peak Diode Recovery dv/dt Test Circuit

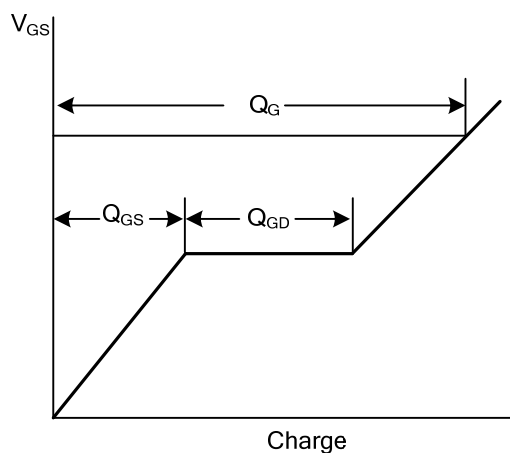


Peak Diode Recovery dv/dt Waveforms

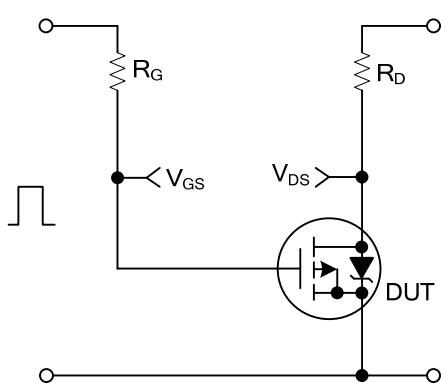
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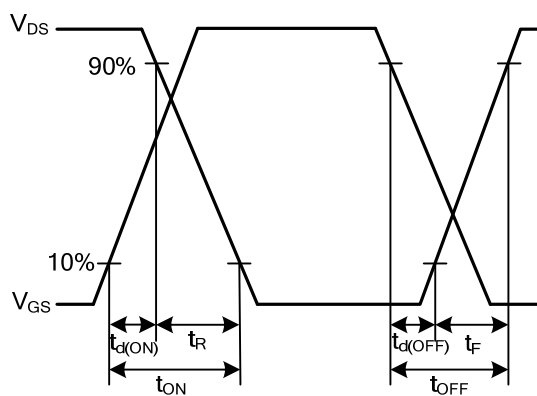
Gate Charge Test Circuit



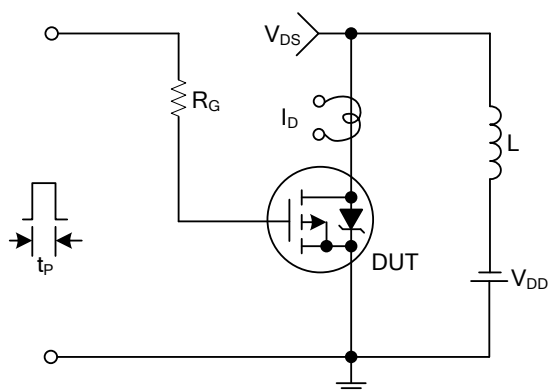
Gate Charge Waveforms



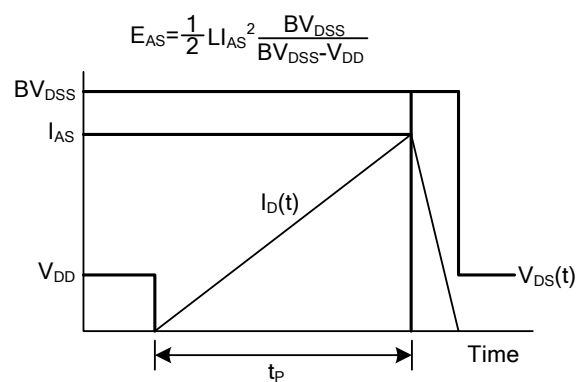
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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