



UT2N15

POWER MOSFET

2.0A, 150V N-CHANNEL POWER MOSFET

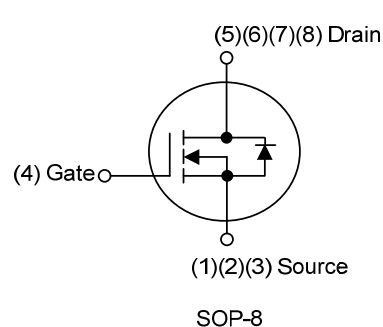
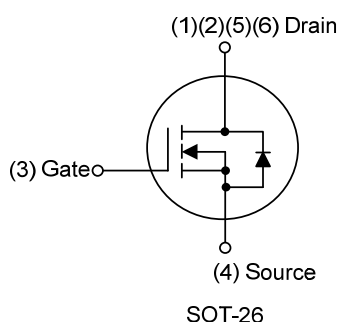
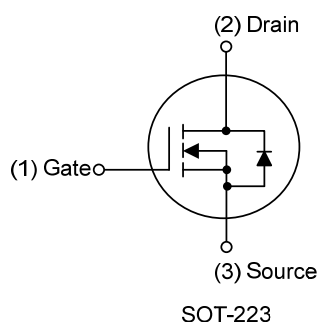
DESCRIPTION

The UTC **UT2N15** is a high voltage power MOSFET combines advanced trench MOSFET designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and high rugged avalanche characteristics. This power MOSFET is usually used in high speed switching applications of switching power supplies and adaptors.

FEATURES

- * $R_{DS(ON)} \leq 0.3 \Omega$ @ $V_{GS}=10V$, $I_D=1.0A$
- * Fast switching capability
- * Avalanche energy tested
- * Improved dv/dt capability, high ruggedness

SYMBOL

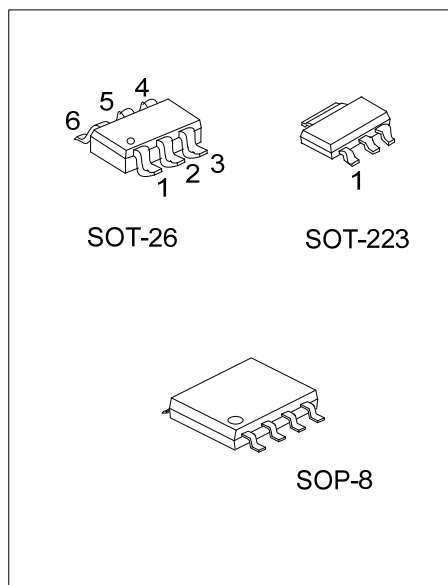


ORDERING INFORMATION

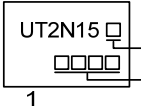
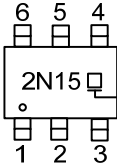
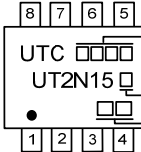
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT2N15L-AA3-R	UT2N15G-AA3-R	SOT-223	G	D	S	-	-	-	-	-	Tape Reel
UT2N15L-AG6-R	UT2N15G-AG6-R	SOT-26	D	D	G	S	D	D	-	-	Tape Reel
UT2N15L-S08-R	UT2N15G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT2N15G-AA3-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) AA3: SOT-223, AG6: SOT-26, S08: SOP-8</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING

PACKAGE	MARKING
SOT-223	<div><div>L: Lead Free G: Halogen Free Date Code</div></div>
SOT-26	<div><div>L: Lead Free G: Halogen Free</div></div>
SOP-8	<div><div>Date Code L: Lead Free G: Halogen Free Lot Code</div></div>

■ ABSOLUTE MAXIMUM RATING ($T_A=25^{\circ}\text{C}$, 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	2	A
	Pulsed	I_{DM}	4	A
Avalanche Energy	Single Pulsed (Note 4)	E_{AS}	1.2	mJ
Peak Diode Recovery dv/dt (Note 5)		dv/dt	1.2	V/ns
Power Dissipation (Note 3)	SOT-223	P_D	1.2	W
	SOT-26		0.4	W
	SOP-8		1	W
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature Range		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. Surface mounted on 1 in² copper pad of FR-4 board. 270 $^{\circ}\text{C}/\text{W}$ when mounted on minimum copper pad.

4. $L=0.1\text{mH}$, $I_{AS}=4.8\text{A}$, $V_{DD}=20\text{V}$, $R_G=25\ \Omega$, Starting $T_J = 25^{\circ}\text{C}$

5. $I_{SD}\leq 1.5\text{A}$, $di/dt\leq 200\text{A}/\mu\text{s}$, $V_{DD}\leq BV_{DSS}$, Starting $T_J = 25^{\circ}\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-223	θ_{JA}	104	$^{\circ}\text{C}/\text{W}$
	SOT-26		350	$^{\circ}\text{C}/\text{W}$
	SOP-8		125	$^{\circ}\text{C}/\text{W}$

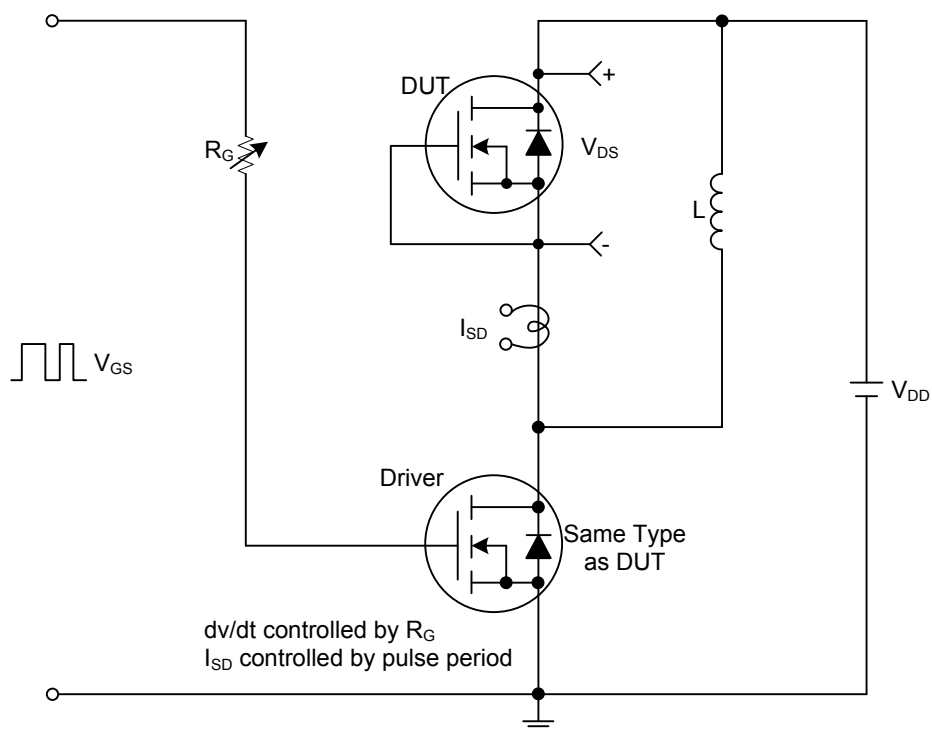
Note: Surface mounted on 1 in² copper pad of FR-4 board. 270 $^{\circ}\text{C}/\text{W}$ when mounted on minimum copper pad.

■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

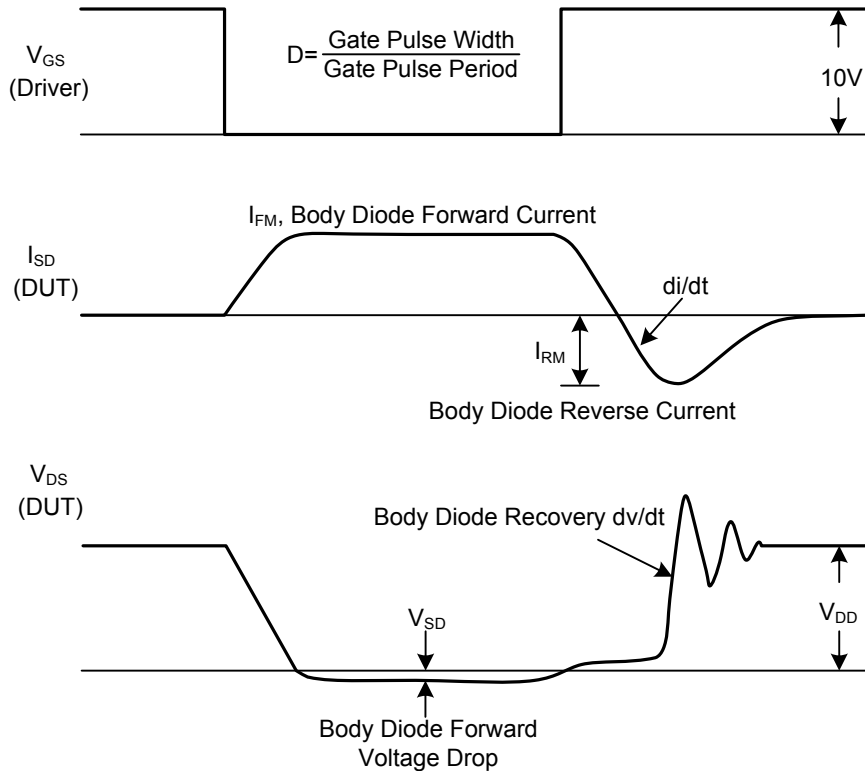
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	150			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =150V, V _{GS} =0V			10	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			+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 =1.0A			0.3	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		400		pF
Output Capacitance		C _{OSS}			40		pF
Reverse Transfer Capacitance		C _{RSS}			22		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =120V, V _{GS} =10V, I _D =2.0A (Note 1, 2)		14		nC
Gate to Source Charge		Q _{GS}			3		nC
Gate to Drain Charge		Q _{GD}			1.4		nC
Turn-on Delay Time (Note 1)		t _{D(ON)}	V _{DD} =100V, V _{GS} =10V, I _D =2.0A, R _G =25Ω (Note 1, 2)		6		ns
Rise Time		t _R			18		ns
Turn-off Delay Time		t _{D(OFF)}			33		ns
Fall-Time		t _F			24		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				2	A
Maximum Body-Diode Pulsed Current		I _{SM}				4	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =2.0A, V _{GS} =0V			1.0	V
Reverse Recovery Time		t _{rr}	I _S =2.0A, V _{GS} =0V,		54		ns
Reverse Recovery Charge		Q _{rr}	dI _F /dI _t =100A/μs		188		nC

Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



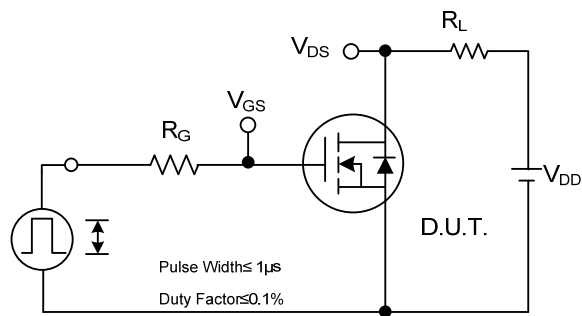
Peak Diode Recovery dv/dt Test Circuit



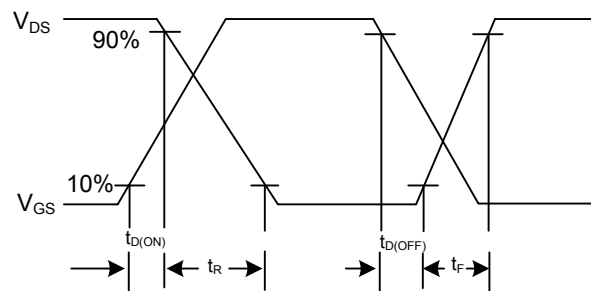
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

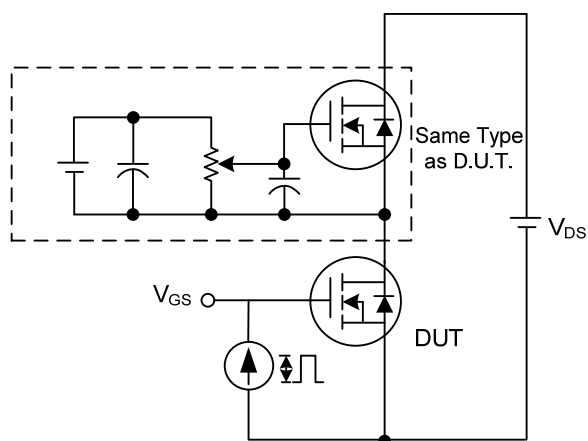
■ TEST CIRCUITS AND WAVEFORMS



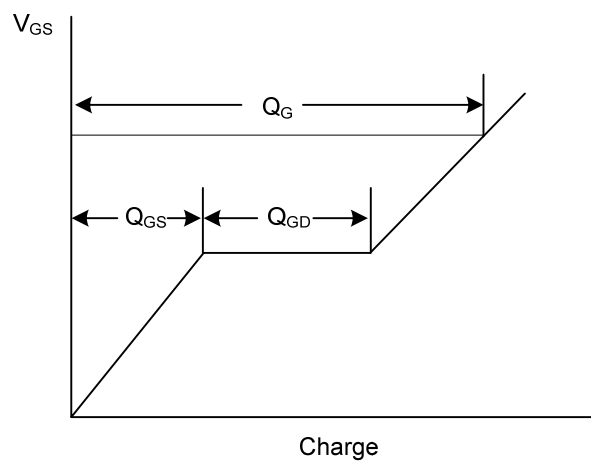
Switching Test Circuit



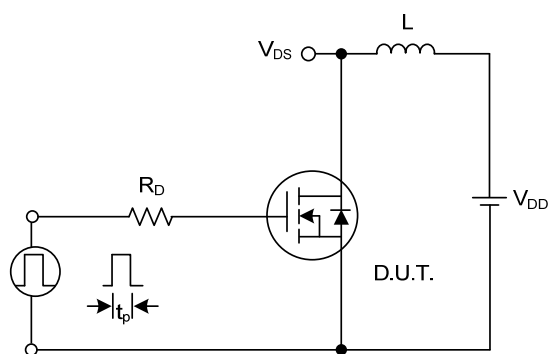
Switching Waveforms



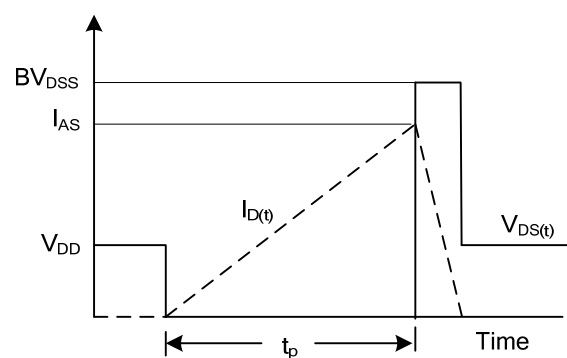
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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