



UT3443

Power MOSFET

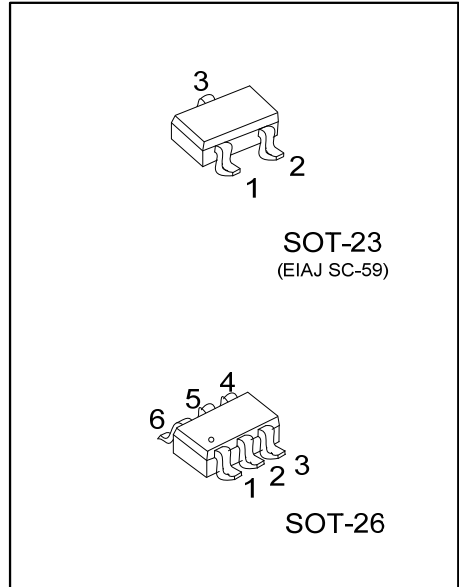
P-CHANNEL 2.5V (G-S) MOSFET

■ DESCRIPTION

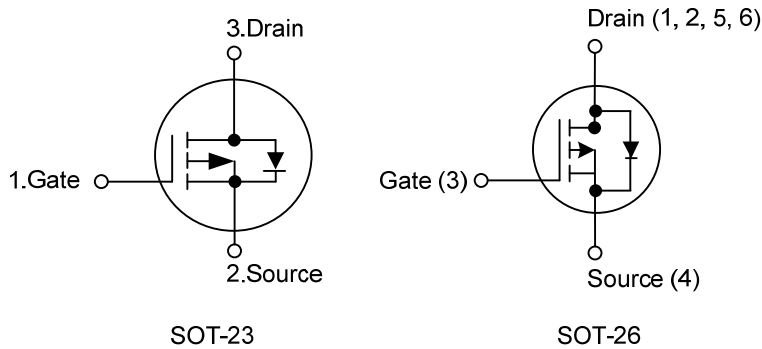
The UTC **UT3443** is a P-channel power MOSFET using UTC's advanced trench technology to provide customers with a minimum on-state resistance and extremal low gate charge with a 12V gate rating.

■ FEATURES

- * $V_{DS(V)} = -20V$
- * $I_D = -4.5A$
- * $R_{DS(ON)} \leq 100\ m\Omega$ @ $V_{GS} = -2.5V, I_D = -3.7A$
- $R_{DS(ON)} \leq 90\ m\Omega$ @ $V_{GS} = -2.7V, I_D = -3.8A$
- $R_{DS(ON)} \leq 65\ m\Omega$ @ $V_{GS} = -4.5V, I_D = -4.5A$



■ SYMBOL



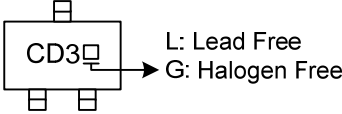
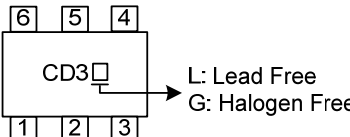
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5	6	
UT3443L-AE3-R	UT3443G-AE3-R	SOT-23	G	S	D	-	-	-	Tape Reel
UT3443L-AG6-R	UT3443G-AG6-R	SOT-26	D	D	G	S	D	D	Tape Reel

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

<p>UT3416G-AE3-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) AE3: SOT-23, AG6: SOT-26</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING

SOT-23	SOT-26
 <p>The diagram shows a rectangular SOT-23 package with three leads. The top lead is labeled 'CD3'. An arrow points from the 'CD3' marking to the text 'L: Lead Free' and 'G: Halogen Free'.</p>	 <p>The diagram shows a rectangular SOT-26 package with six leads. The top three leads are labeled 6, 5, and 4 from left to right. The bottom three leads are labeled 1, 2, and 3 from left to right. The marking 'CD3' is located on the right side of the package. An arrow points from the 'CD3' marking to the text 'L: Lead Free' and 'G: Halogen Free'.</p>

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

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		V_{DSS}	-20	V	
Gate-Source Voltage		V_{GSS}	± 12	V	
Drain Current	Continuous	I_D	$T_C=25^{\circ}\text{C}$	-4.5	A
			$T_C=70^{\circ}\text{C}$	-3.6	A
	Pulsed	I_{DM}	-20	A	
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	273	mJ	
Power Dissipation (Note 2)		P_D	1.2	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. $L=0.1\text{mH}$, $I_{AS}=-16.6\text{A}$, $V_{DD}=-50\text{V}$, $R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	104	$^{\circ}\text{C/W}$

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

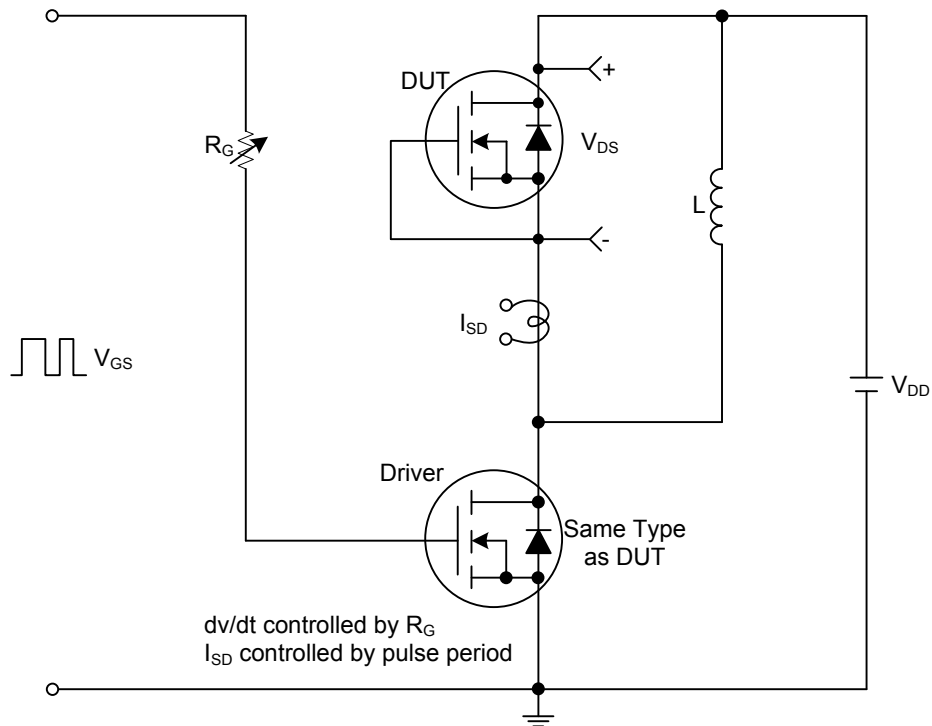
■ ELECTRICAL CHARACTERISTICS ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
OFF CHARACTERISTICS							
Gate Threshold Voltage	BV_{DSS}	$V_{GS}=0\text{V}$, $I_D=250\mu\text{A}$	-20			V	
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-20\text{V}$, $V_{GS}=0\text{V}$			-1.0	μA	
		$V_{DS}=-20\text{V}$, $V_{GS}=0\text{V}$			-5.0		
Gate- Source Leakage Current	I_{GSS}	Forward	$V_{GS}=+12\text{V}$, $V_{DS}=0\text{V}$			+100	nA
		Reverse	$V_{GS}=-12\text{V}$, $V_{DS}=0\text{V}$			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=-250\mu\text{A}$	-0.4		-1.2	V	
Static Drain-Source On-State Resistance (Note 1)	$R_{DS(ON)}$	$V_{GS}=-4.5\text{V}$, $I_D=-4.5\text{A}$			65	m Ω	
		$V_{GS}=-2.7\text{V}$, $I_D=-3.8\text{A}$			90	m Ω	
		$V_{GS}=-2.5\text{V}$, $I_D=-3.7\text{A}$			100	m Ω	
DYNAMIC PARAMETERS							
Input Capacitance	C_{ISS}	$V_{DS}=-10\text{V}$, $V_{GS}=0\text{V}$, $f=1.0\text{MHz}$		966.5		pF	
Output Capacitance	C_{OSS}			204.2		pF	
Reverse Transfer Capacitance	C_{RSS}			181.9		pF	
SWITCHING PARAMETERS (Note 2)							
Total Gate Charge	Q_G	$V_{DS}=-16\text{V}$, $V_{GS}=-4.5\text{V}$, $I_D=-4.5\text{A}$ $I_G=-1\text{mA}$ (Note 1, 2)		15		nC	
Gate to Source Charge	Q_{GS}			2.5		nC	
Gate to Drain Charge	Q_{GD}			4		nC	
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=-10\text{V}$, $V_{GS}=-10\text{V}$, $I_D=-4.5\text{A}$, $R_G=6\Omega$ (Note 1, 2)		5.4		ns	
Rise Time	t_R			16.9		ns	
Turn-OFF Delay Time	$t_{D(OFF)}$			50.2		ns	
Fall-Time	t_F			30.2		ns	
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current	I_S				-4.5	A	
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				-20	A	
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=-1.7\text{A}$, $V_{GS}=0\text{V}$			1.4	V	

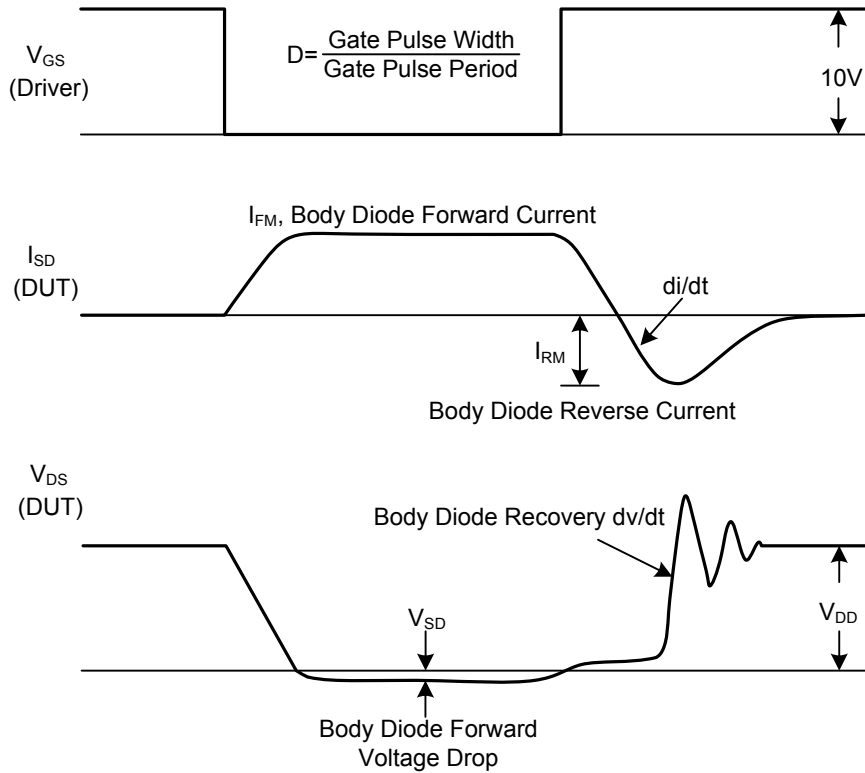
Notes: 1. Pulse Test : Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating ambient temperature.

TEST CIRCUITS AND WAVEFORMS



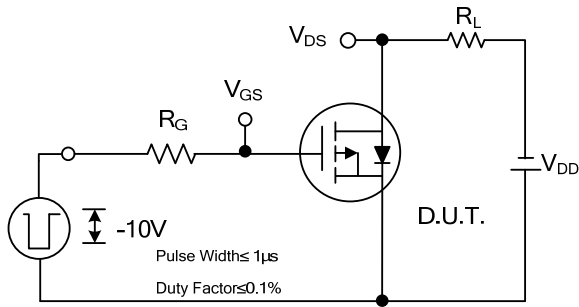
Peak Diode Recovery dv/dt Test Circuit



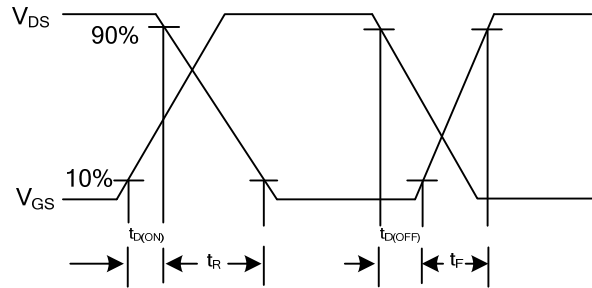
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

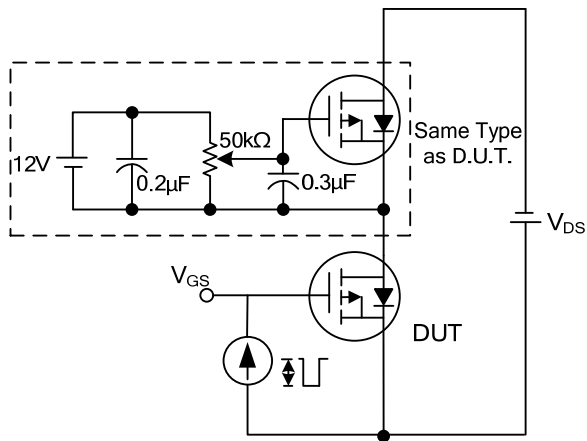
TEST CIRCUITS AND WAVEFORMS



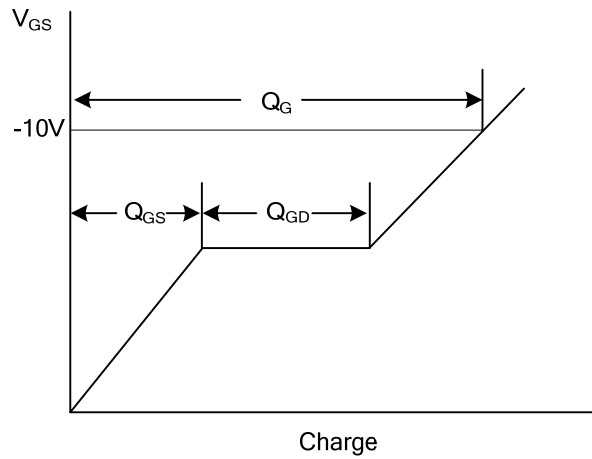
Switching Test Circuit



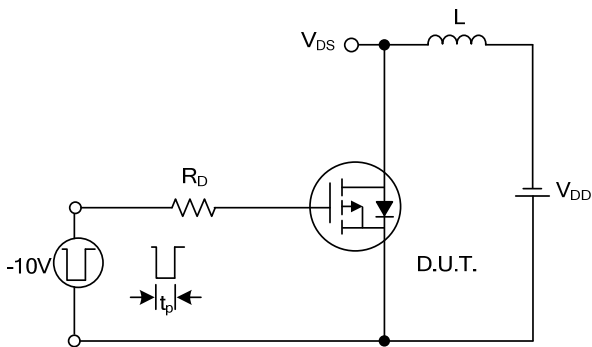
Switching Waveforms



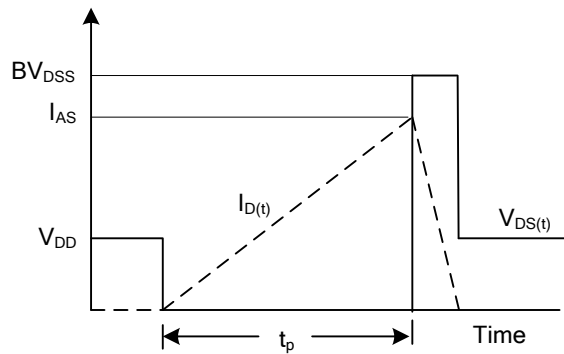
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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