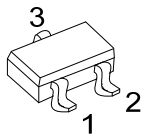
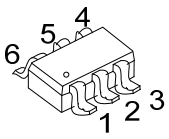
P-CHANNEL 2.5V (G-S) MOSFET



SOT-23
(EIAJ SC-59)



SOT-26

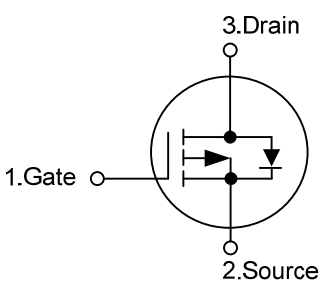
■ DESCRIPTION

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.

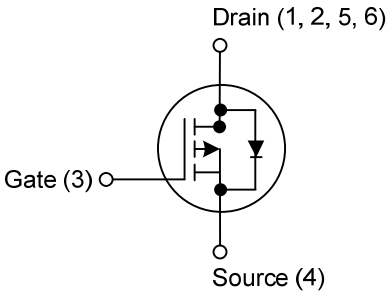
■ FEATURES

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

■ SYMBOL



SOT-23



SOT-26

■ ORDERING INFORMATION

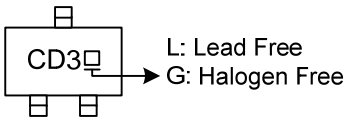
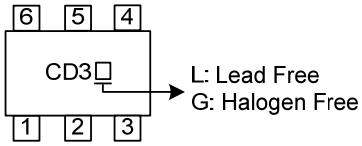
Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5	6	
UT3443L-AE3-R	UT3443G-AE3-R	SOT-23	G	S	D	-	-	-	Tape Reel
UT3443L-AG6-R	UT3443G-AG6-R	SOT-26	D	D	G	S	D	D	Tape Reel

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

UT3416G-AE3-R

(1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) AE3: SOT-23, AG6: SOT-26
(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

SOT-23	SOT-26
	

■ ABSOLUTE MAXIMUM RATINGS (T_A=25°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	T_C=25°C	I_D	-4.5	A
		T_C=70°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	°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=0.1mH, I_{AS}=-16.6A, V_{DD}=-50V, R_G=25Ω, Starting T_J=25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	104	°C/W

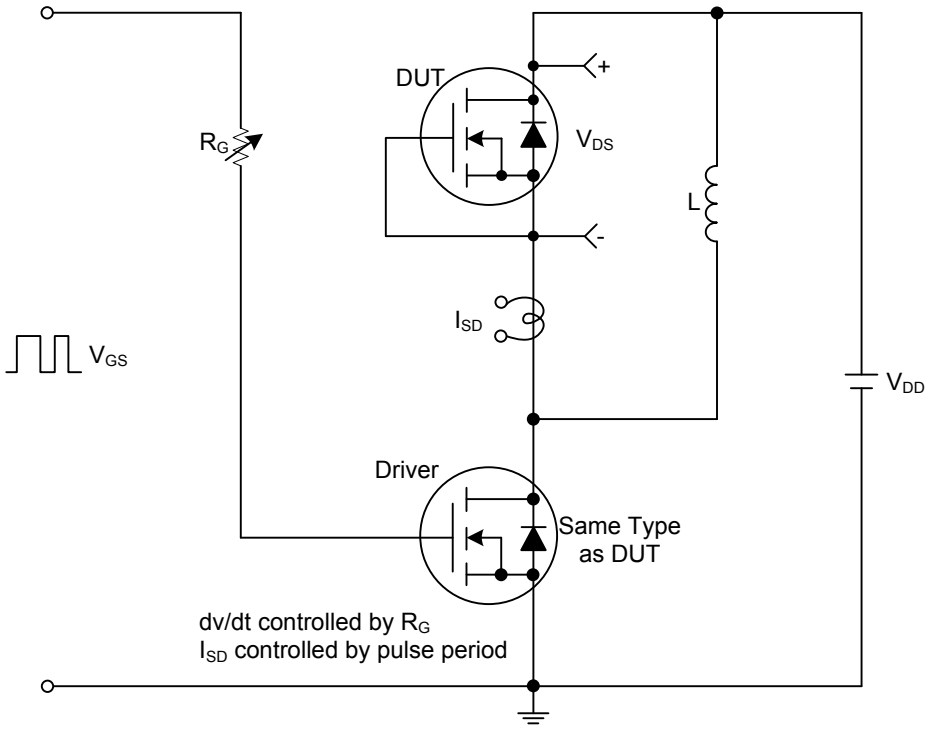
Note: Device mounted on FR-4 substrate P_C board, 2oz copper, with 1inch square copper plate.

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

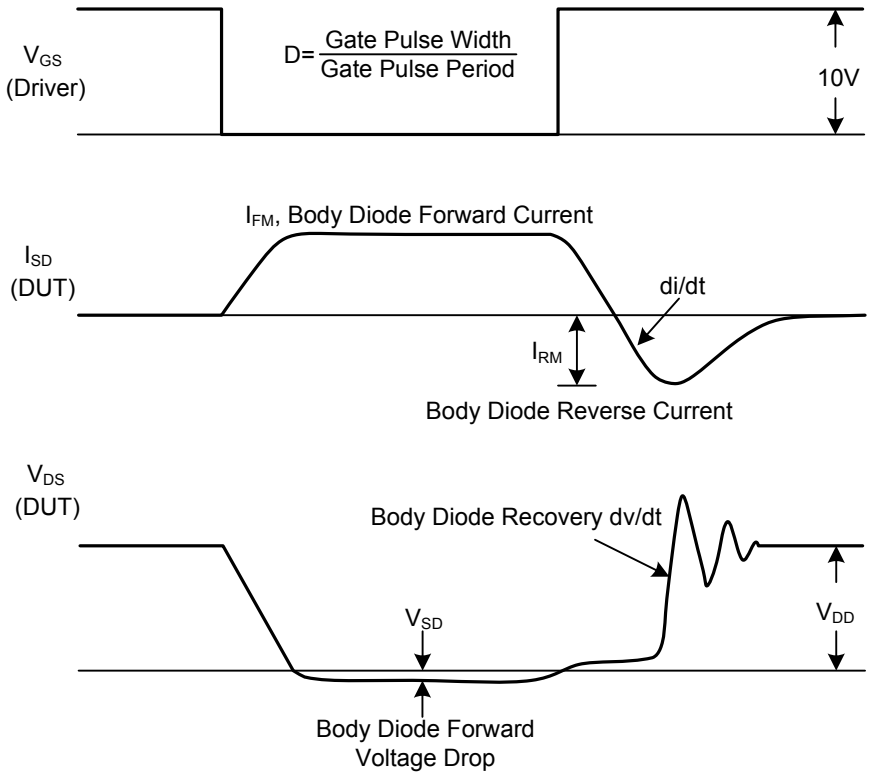
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Gate Threshold Voltage		BV_{DSS}	V_{GS}=0V, I_D=250μA	-20			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=-20V, V_{GS}=0V			-1.0	μA
			V_{DS}=-20V, V_{GS}=0V			-5.0	
Gate- Source Leakage Current	Forward	I_{GSS}	V_{GS}=+12V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-12V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.4		-1.2	V
Static Drain-Source On-State Resistance (Note 1)		$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-4.5A			65	mΩ
			V_{GS}=-2.7V, I_D=-3.8A			90	mΩ
			V_{GS}=-2.5V, I_D=-3.7A			100	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{DS}=-10V, V_{GS}=0V, f=1.0MHz		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}=-16V, V_{GS}=-4.5V, I_D=-4.5A I_G=-1mA (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}=-10V, V_{GS}=-10V, I_D=-4.5A, R_G=6Ω (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=-1.7A, V_{GS}=0V			1.4	V

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

■ TEST CIRCUITS AND WAVEFORMS



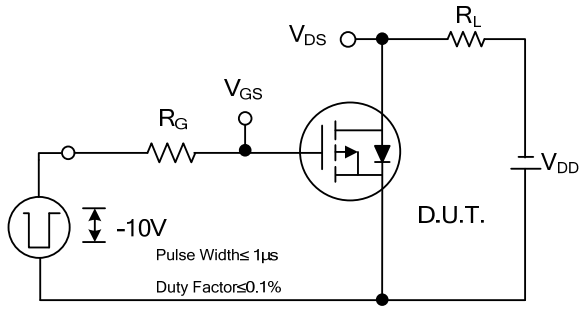
Peak Diode Recovery dv/dt Test Circuit



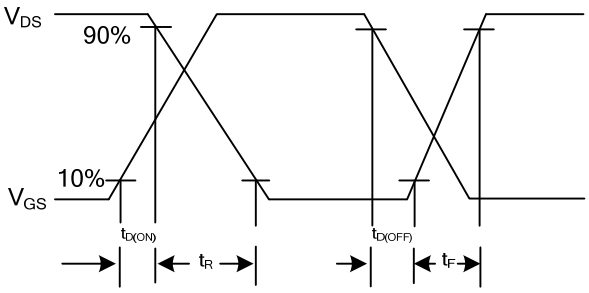
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

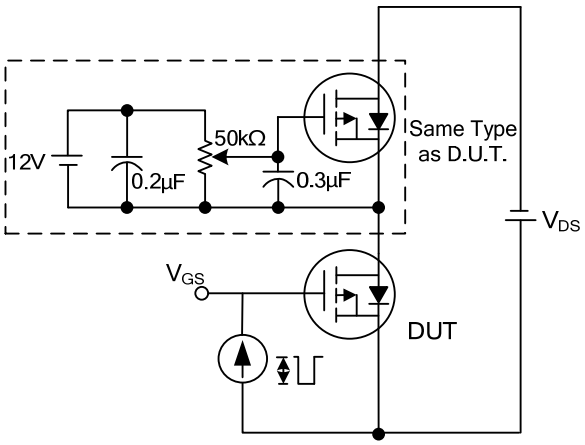
■ TEST CIRCUITS AND WAVEFORMS



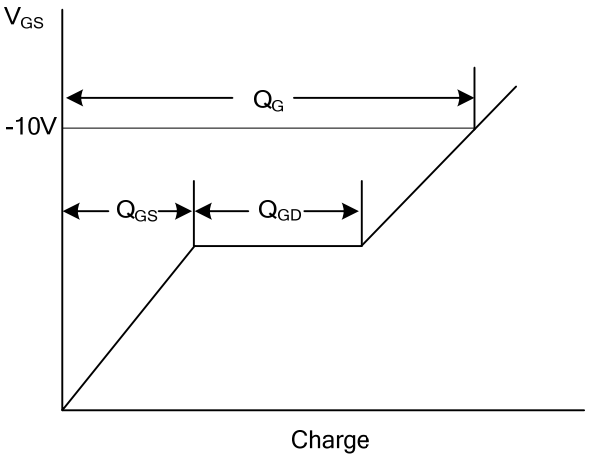
Switching Test Circuit



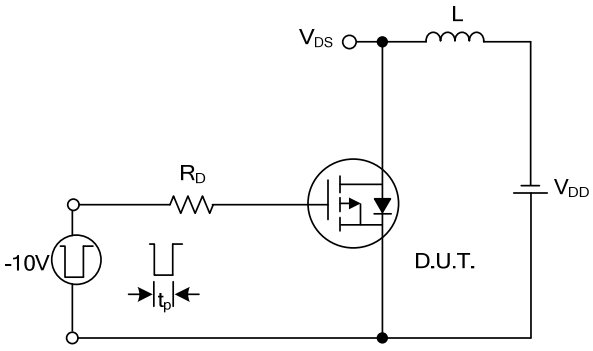
Switching Waveforms



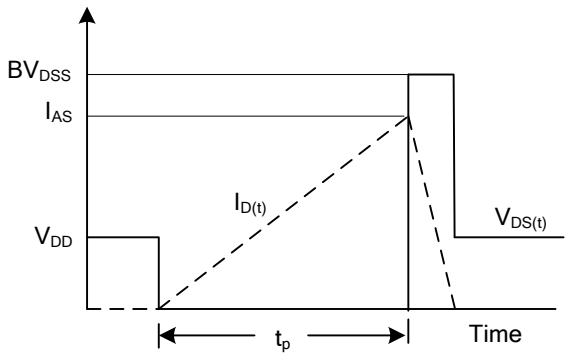
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms