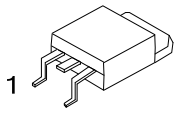
-35A, -60V P-CHANNEL (D-S) POWER MOSFET



TO-252

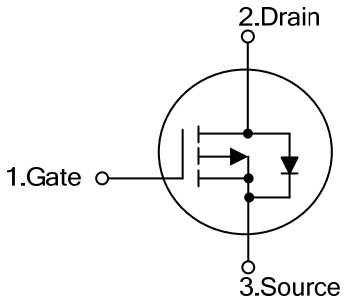
■ DESCRIPTION

The UTC **UTT50P06-H** is a P-channel power MOSFET using UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance, and withstand high energy pulse in the avalanche and commutation mode. The UTC **UTT50P06-H** well suited for high efficiency fast switching applications.

■ FEATURES

* $R_{DS(ON)}$< 30mΩ @ V_{GS}=-10V, I_D=-8.0A
  $R_{DS(ON)}$< 40mΩ @ V_{GS}=-4.5V, I_D=-6.0A
* Fast switching
* Green Device Available
* Suit for -4.5V Gate Drive Applications

■ SYMBOL



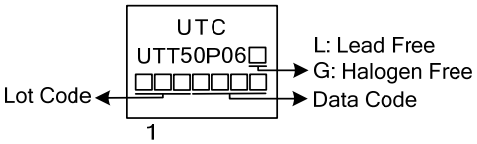
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT50P06L-TN3-R	UTT50P06G-TN3-R	TO-252	G	D	S	Tape Reel

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

UTT50P06G-TN3-R (1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) TN3: TO-252
(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



Copyright © 2017 Unisonic Technologies Co., Ltd

■ ABSOLUTE MAXIMUM RATINGS (T_C=25°C, unless otherwise specified)

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V_{DSS}	-60	V
Gate-Source Voltage			V_{GSS}	±20	V
Drain Current	Continuous	T_C=25°C	I_D	-35	A
		T_C=100°C		-22.1	A
	Pulsed		I_{DM}	-140	A
Power Dissipation			P_D	72.6	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.

■ THERMAL CHARACTERISTICS

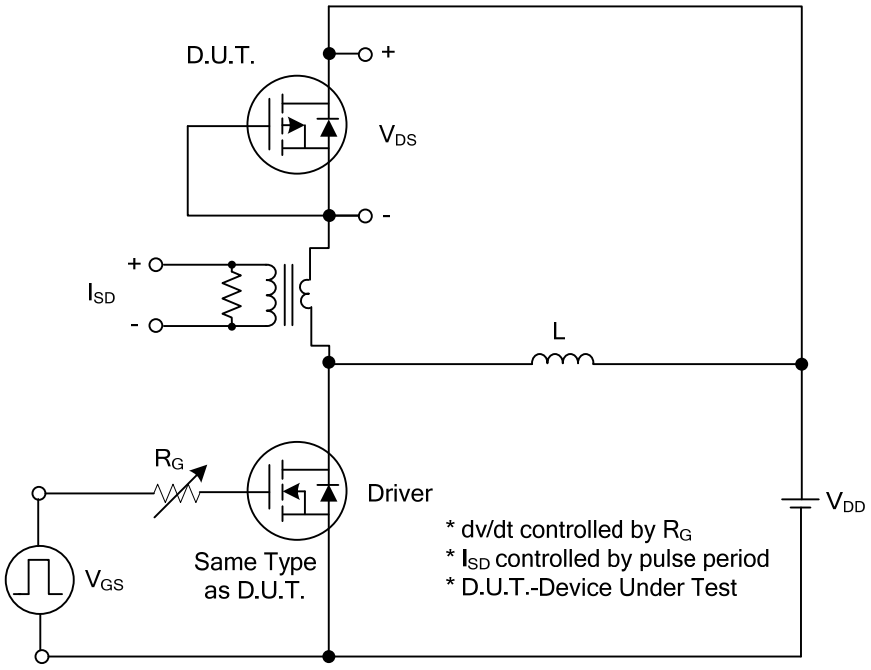
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62	°C/W
Junction to Case	θ_{JC}	1.72	°C/W

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

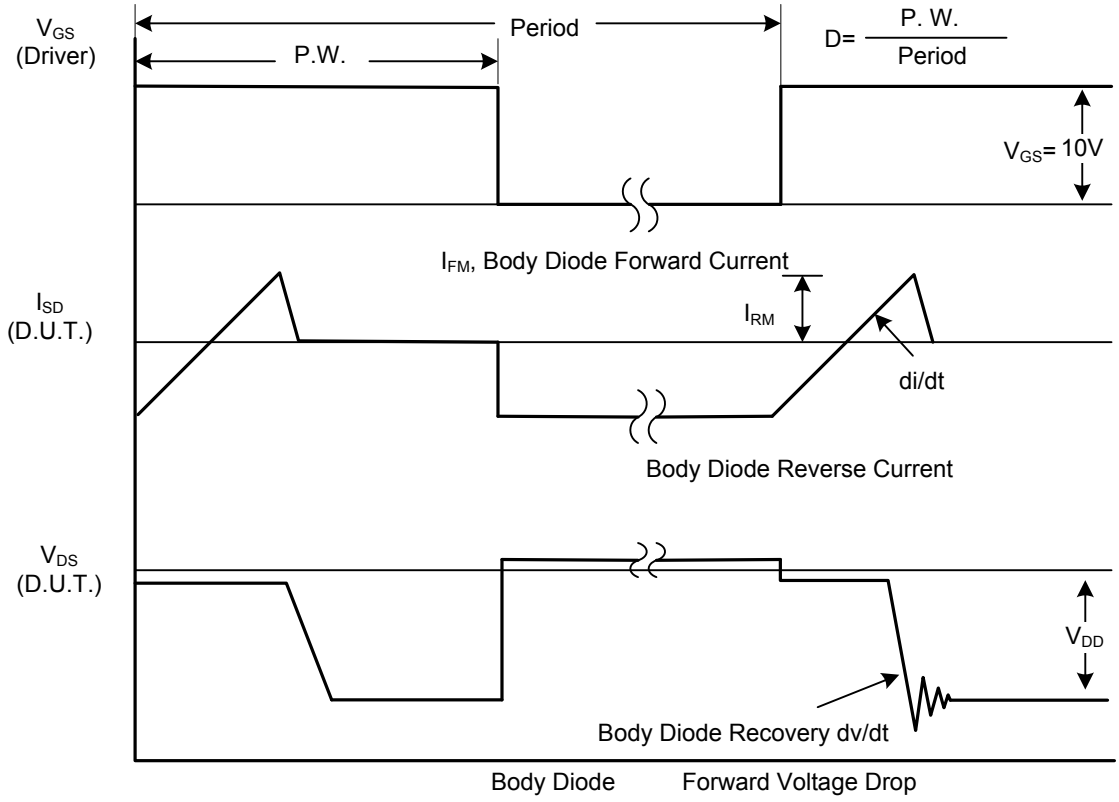
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS}=0 V, I_D=-250μA	-60			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=-60V, V_{GS}=0V			-1	μA
			V_{DS}=-48V, V_{GS}=0V, T_J=125°C			-10	μA
Gate-Source Leakage Current	Forward	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	-1.0		-2.5	V
Static Drain-Source On-Resistance		$R_{DS(ON)}$	V_{GS}=-10V, I_D=-8.0A			30	mΩ
			V_{GS}=-4.5V, I_D=-6.0A			40	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{DS}=-25V, V_{GS}=0V, f=1.0MHz		2595	3900	pF
Output Capacitance		C_{OSS}			162	240	pF
Reverse Transfer Capacitance		C_{RSS}			115	170	pF
SWITCHING PARAMETERS (Note 1, 2)							
Total Gate Charge		Q_G	V_{DS}=-30V, V_{GS}=-10V, I_D=-5.0A		43.8	88	nC
Gate Source Charge		Q_{GS}			4.6	9	nC
Gate Drain Charge		Q_{GD}			8.3	17	nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DD}=-30V, V_{GS}=-10V, I_D=-1.0A, R_G=6.0Ω		25	50	ns
Turn-ON Rise Time		t_R			13.8	28	ns
Turn-OFF Delay Time		$t_{D(OFF)}$			148	29	ns
Turn-OFF Fall-Time		t_F			51	100	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				-35	A
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}				-70	A
Diode Forward Voltage		V_{SD}	I_S=-1.0A, V_{GS}=0V			-1	V

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

■ TEST CIRCUITS AND WAVEFORMS

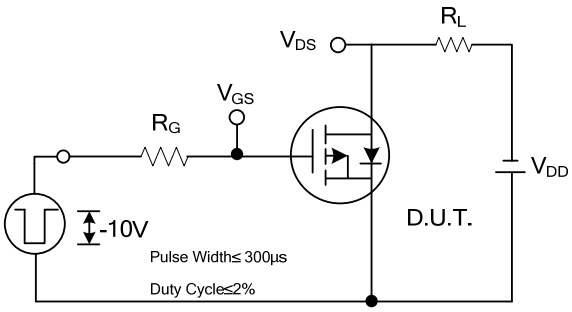


Peak Diode Recovery dv/dt Test Circuit

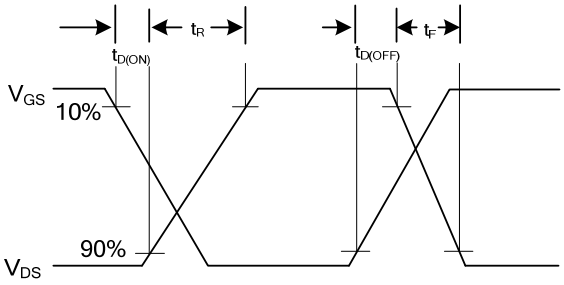


Peak Diode Recovery dv/dt Waveforms

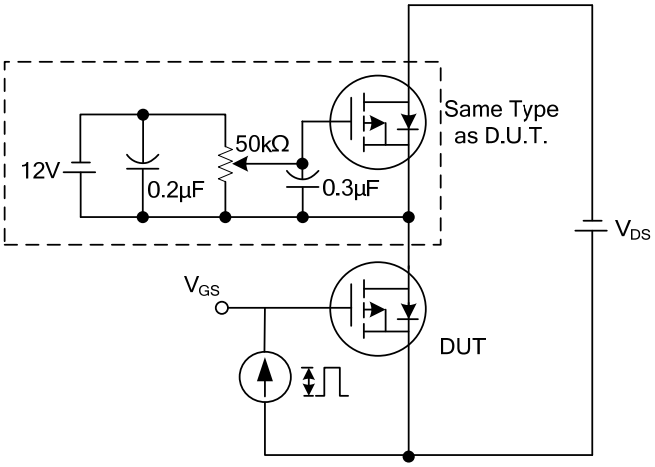
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



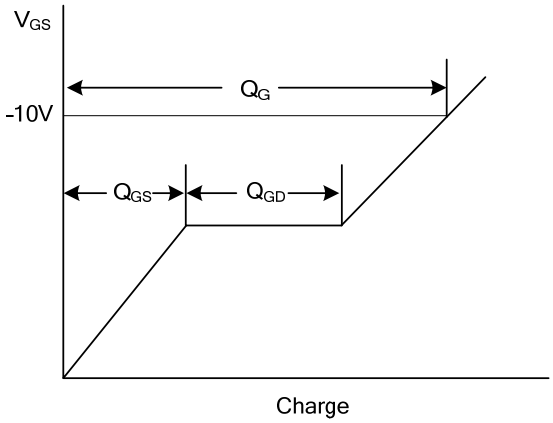
Switching Test Circuit



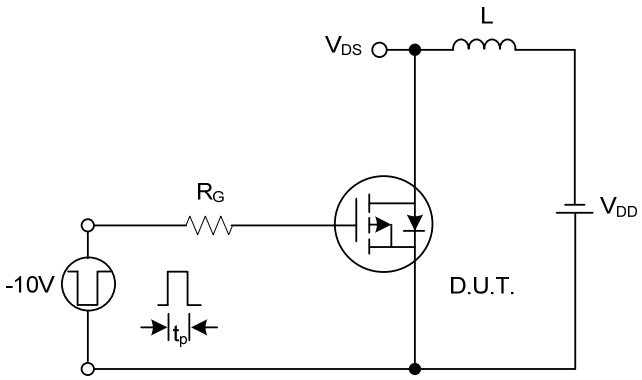
Switching Waveforms



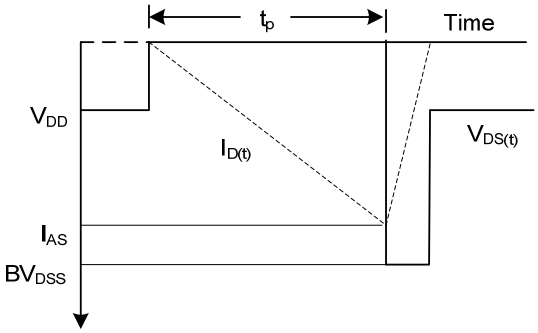
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.