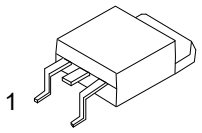
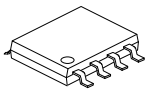
UT10P06

Power MOSFET

-10A, -60V P-CHANNEL POWER MOSFET



TO-252



SOP-8

■ DESCRIPTION

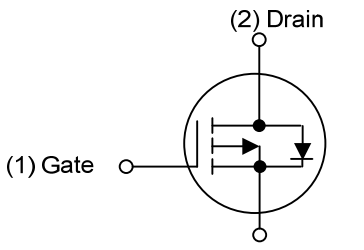
The UTC **UT10P06** is a P-channel MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on state resistance and low gate charge, etc.

The UTC **UT10P06** is suitable for load switch and battery protection applications.

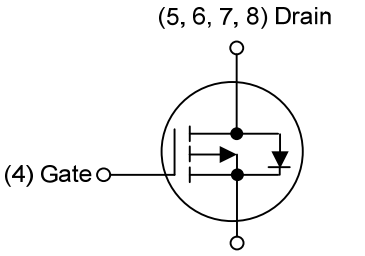
■ FEATURES

* $R_{DS(ON)} \leq 120\ m\Omega$ @ V_{GS}=-10V, I_D=-2.5A
  $R_{DS(ON)} \leq 160\ m\Omega$ @ V_{GS}=-4.5V, I_D=-2.5A
* Improved dv/dt capability
* Fast switching

■ SYMBOL



TO-252



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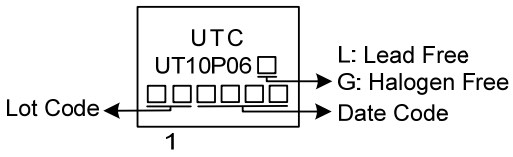
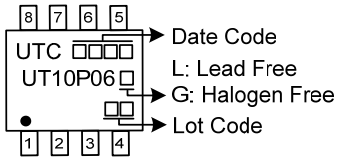
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT10P06L-TN3-R	UT10P06G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UT10P06L-S08-R	UT10P06G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

UT10P06G-TN3-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) TN3: TO-252, S08: SOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

TO-252	SOP-8
	

■ 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
Continuous Drain Current		I_D	-10	A
Pulsed Drain Current (Note 2)		I_{DM}	-20	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	8.3	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	3	V/ns
Power Dissipation	TO-252	P_D	32	W
	SOP-8		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} = -13A, V_{DD} = -50V, R_G = -25Ω, Starting T_J = 25°C
4. I_{SD} ≤ -10A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-252	θ_{JA}	50	°C/W
	SOP-8		125	°C/W
Junction to Case	TO-252	θ_{JC}	3.9	°C/W
	SOP-8		104	°C/W

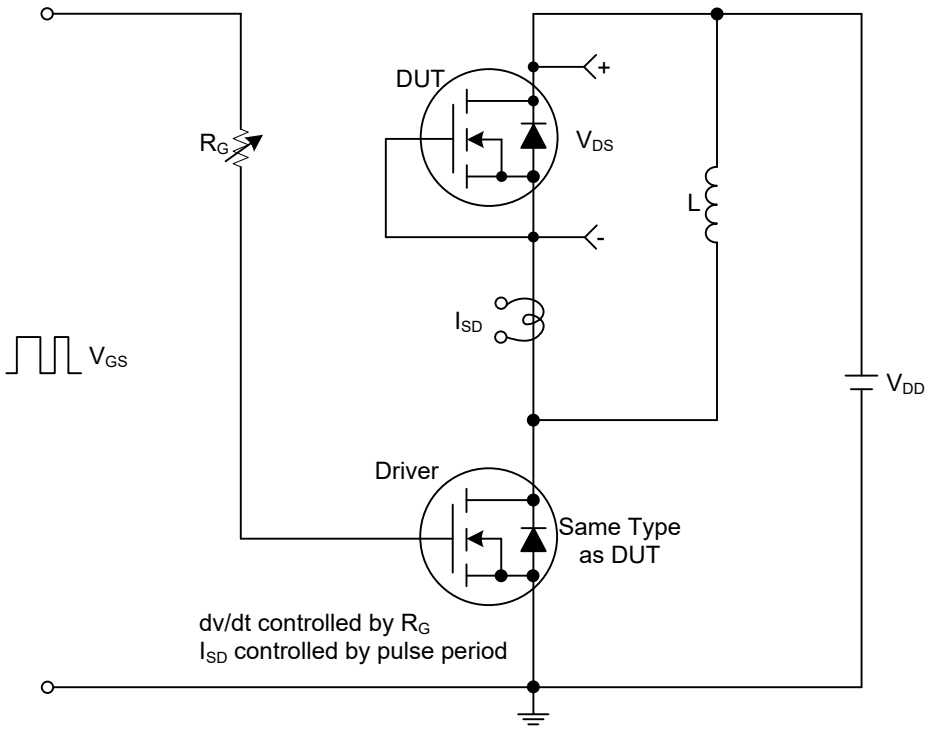
Note: Device mounted on FR-4 substrate P_C board, 2oz copper, with 1inch square copper plate.

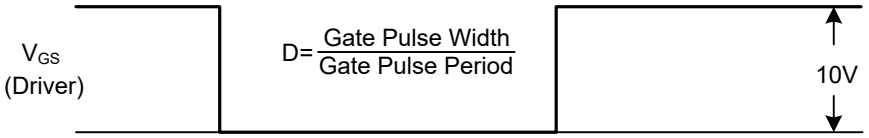
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

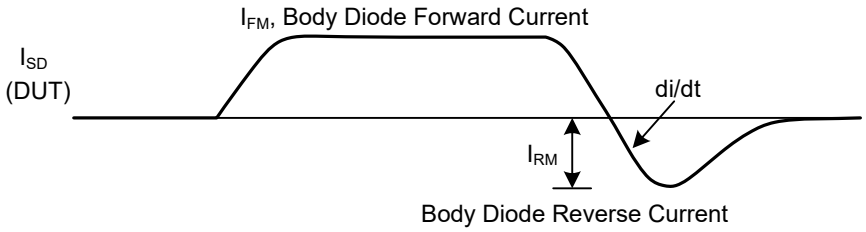
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=-250μA, V_{GS}=0V	-60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-60V, V_{GS}=0V			-1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=-250μA	-1.0		-3.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-2.5A			120	mΩ
		V_{GS}=-4.5V, I_D=-2.5A			160	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{GS}=0V, V_{DS}=-25V, f=1.0MHz		710		pF
Output Capacitance	C_{OSS}			52		pF
Reverse Transfer Capacitance	C_{RSS}			42		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DS}=-48V, V_{GS}=0V, I_D=-10A (Note 1, 2)		21		nC
Gate to Source Charge	Q_{GS}			4		nC
Gate to Drain Charge	Q_{GD}			6		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{DS}=-30V, V_{GS}=-10V, I_D=-10A, R_G=3Ω (Note 1, 2)		7		ns
Turn-ON Rise Time	t_R			20		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			18		ns
Turn-OFF Fall-Time	t_F			21		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				-10	A
Diode Forward Voltage	V_{SD}	I_S=-10A,V_{GS}=0V			-1.4	V
Reverse Recovery Time (Note 1)	t_{rr}	I_S=-10A, V_{GS}=0V, dI_F/dt =100A/μs		50		nS
Reverse Recovery Charge	Q_{rr}			35		nC

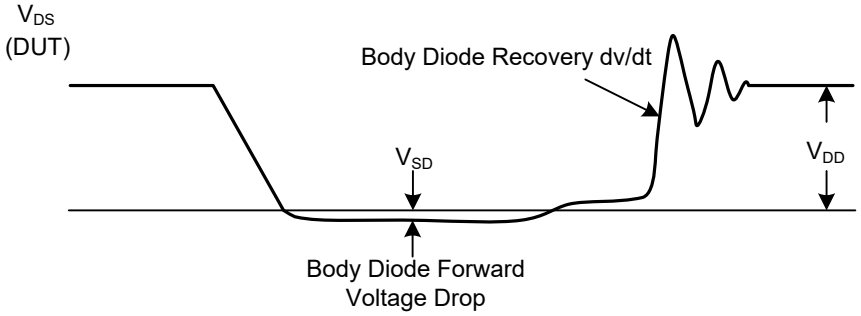
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



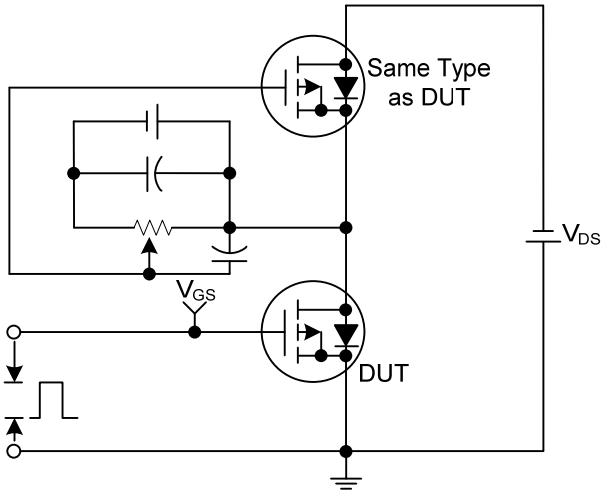




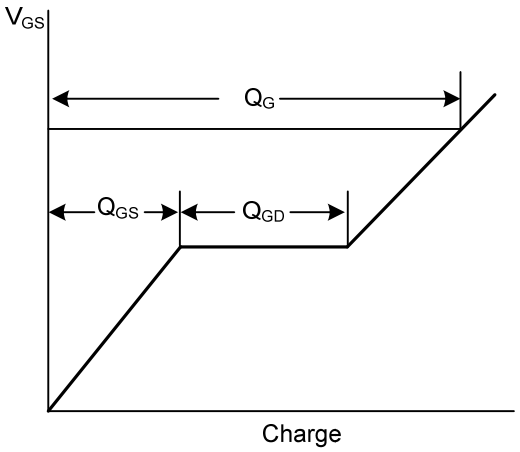


Peak Diode Recovery dv/dt Test Circuit and Waveforms

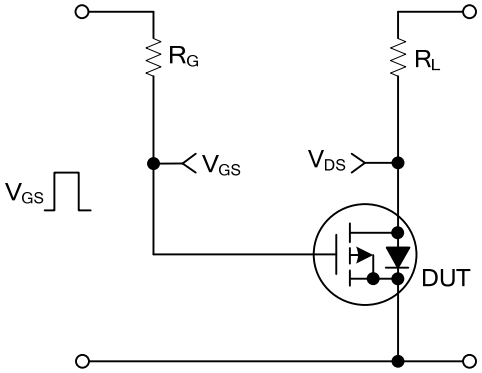
■ TEST CIRCUITS AND WAVEFORMS



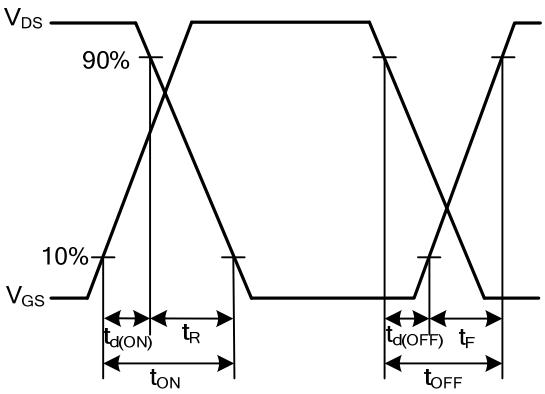
Gate Charge Test Circuit



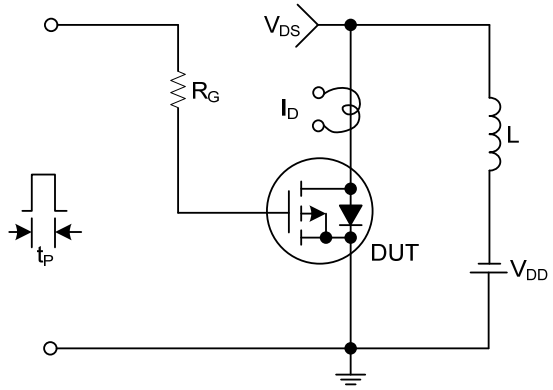
Gate Charge Waveforms



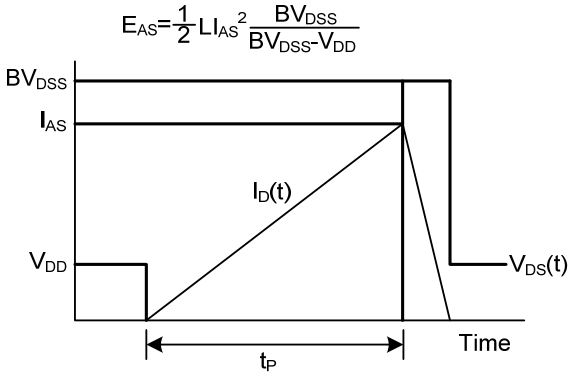
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms