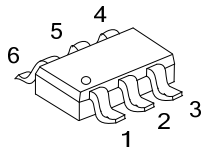
-6.0A, -20V P-CHANNEL POWER MOSFET



SOT-26

■ DESCRIPTION

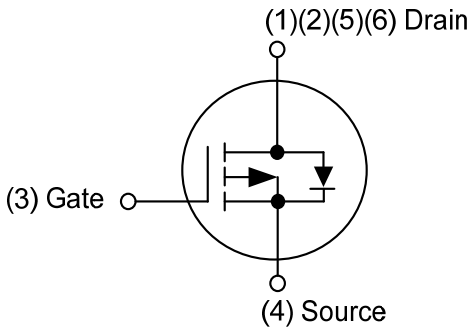
The UTC **UT6P02** is a P-channel MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on state resistance and low gate charge, etc.

The UTC **UT6P02** is suitable for load switch and battery protection applications.

■ FEATURES

* $R_{DS(ON)}$ ≤ 33 mΩ @ V_{GS}=-4.5V, I_D=-3.0A
  $R_{DS(ON)}$ ≤ 50 mΩ @ V_{GS}=-2.5V, I_D=-3.0A
* Improved dv/dt capability
* Fast switching
* Suit for -1.8V gate drive applications

■ SYMBOL



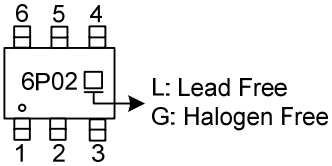
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5	6	
UT6P02L-AG6-R	UT6P02G-AG6-R	SOT-26	D	D	G	S	D	D	Tape Reel

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

UT6P02G-AG6-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AG6: SOT-26 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ 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}	±8	V
Drain Current	Continuous	I_D	-6	A
	Pulsed (Note 2)	I_{DM}	-12	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	33	mJ
Power Dissipation		P_D	1.38	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}=-25A, V_{DD}=-15V, R_G=25 Ω, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	90	°C/W

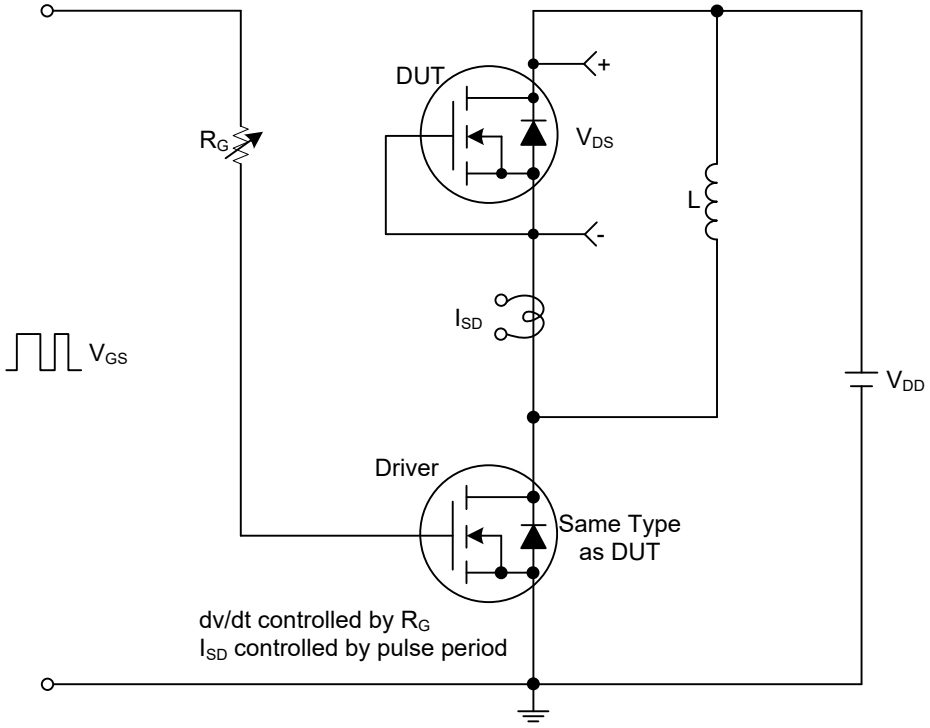
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

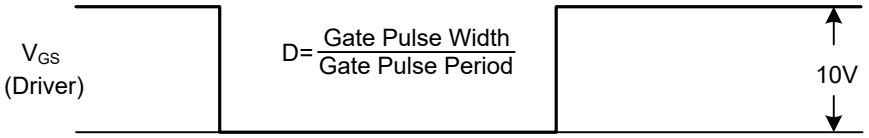
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

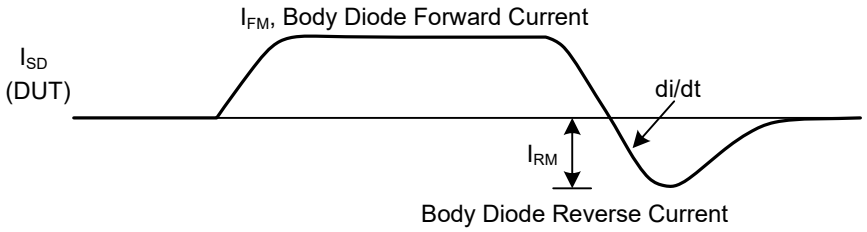
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=-250μA, V_{GS}=0V	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V			-1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.3		-1.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-4.5A			33	mΩ
		V_{GS}=-2.5V, I_D=-4.5A			50	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{GS}=0V, V_{DS}=-10V, f=1.0MHz		1450		pF
Output Capacitance	C_{OSS}			350		pF
Reverse Transfer Capacitance	C_{RSS}			305		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DS}=-16V, V_{GS}=-4.5V, I_D=-6.0A (Note 1, 2)		18		nC
Gate to Source Charge	Q_{GS}			3		nC
Gate to Drain Charge	Q_{GD}			5.2		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{DD}=-10V, V_{GS}=-4.5V, I_D=-6.0A, R_G=3.3Ω (Note 1, 2)		9		ns
Turn-ON Rise Time	t_R			20		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			45		ns
Turn-OFF Fall-Time	t_F			36		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				-6	A
Maximum Body-Diode Pulsed Current	I_{SM}				-12	A
Diode Forward Voltage	V_{SD}	I_S=-1.0A,V_{GS}=0V			-1.2	V

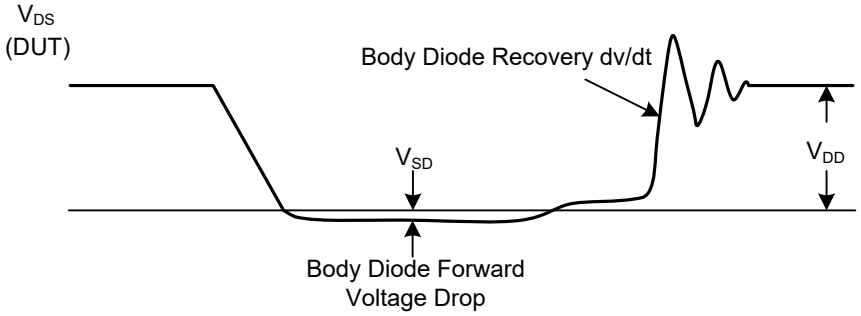
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



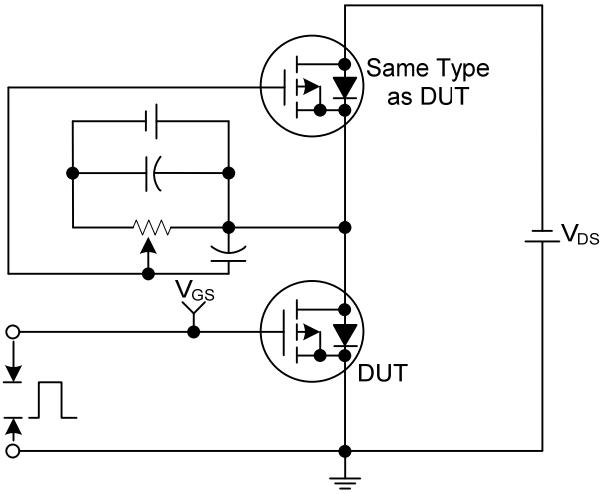




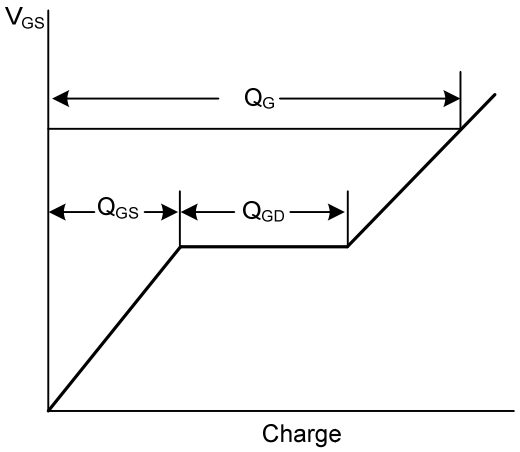


Peak Diode Recovery dv/dt Test Circuit and Waveforms

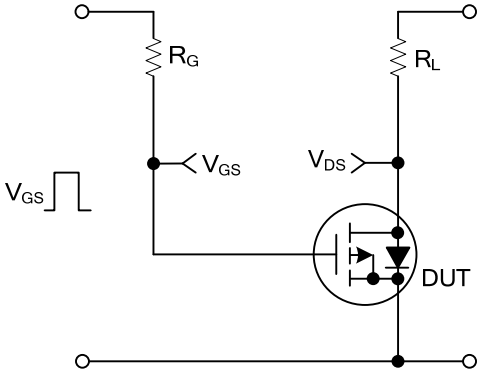
■ TEST CIRCUITS AND WAVEFORMS



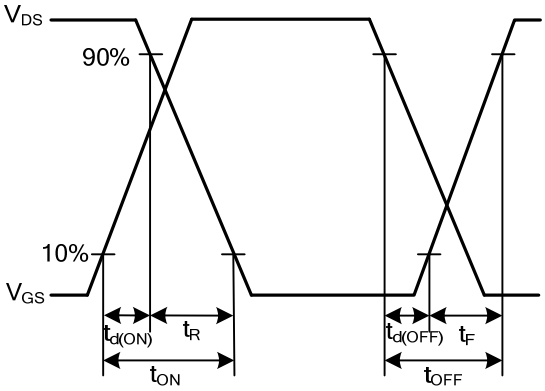
Gate Charge Test Circuit



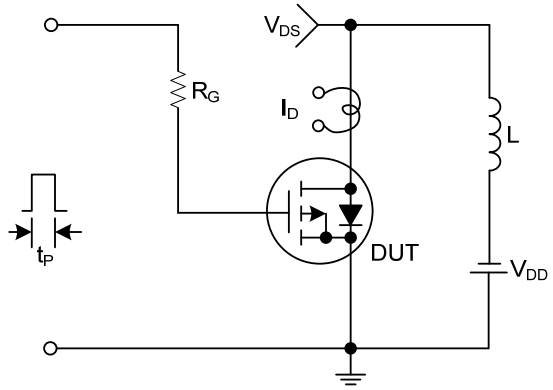
Gate Charge Waveforms



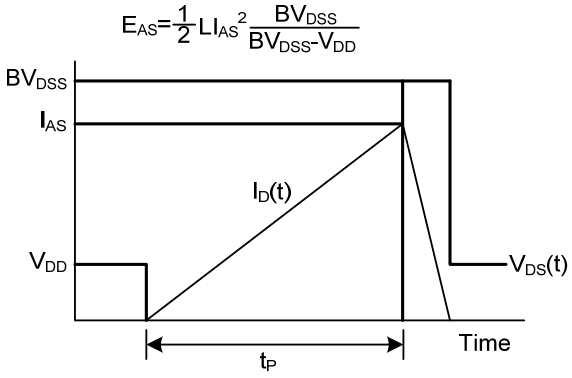
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms