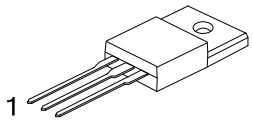
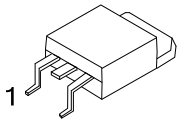
-25A, -60V P-CHANNEL POWER MOSFET



TO-220F



TO-252

■ DESCRIPTION

The UTC **UT25P06H** is a P-channel power MOSFET using UTC's advanced technology.

The advanced MOSFET technology has been especially tailored to reduce on-state resistance, and to provide superior switching performance and high avalanche energy strength. These devices are suitable for switched mode power supplies, audio amplifier, DC motor control, and variable switching power applications

■ FEATURES

* $R_{DS(ON)}$ ≤ 48 mΩ @ V_{GS}=-10V, I_D=-25A
* 100% Avalanche Tested
* High Switching Speed
* High Cell Density Trench Technology

■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT25P06HL-TF3-T	UT25P06HG-TF3-T	TO-220F	G	D	S	Tube
UT25P06HL-TN3-R	UT25P06HG-TN3-R	TO-252	G	D	S	Tape Reel

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

UT25P06HG-TF3-T

(1)Packing Type

(2)Package Type

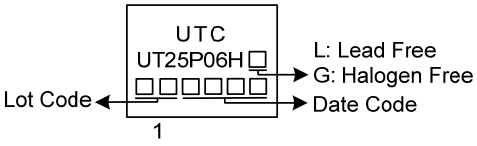
(3)Green Package

(1) T: Tube, R: Tape Reel

(2) TF3: TO-220F, TN3: TO-252

(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ 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}	±25	V
Continuous Drain Current	Continuous	I_D	-25	A
Pulsed Drain Current	Pulsed (Note 2)	I_{DM}	-50	A
Avalanche energy	Single Pulsed (Note 3)	E_{AS}	40	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	7.6	V/ns
Power Dissipation	TO-220F	P_D	39	W
	TO-252		44	W
Junction Temperature		T_J	+150	°C
Storage Temperature Range		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}=-28.2A, V_{DD}=-50V, R_G=25Ω, Starting T_J = 25°C.
4. I_{SD} ≤ -25A, di/dt ≤ 200A/μs, V_{DD} ≤ $V_{(BR)DSS}$, T_J = 25°C.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220F	θ_{JA}	62.5	°C/W
	TO-252		110	°C/W
Junction to Case	TO-220F	θ_{JC}	3.19	°C/W
	TO-252		2.85	°C/W

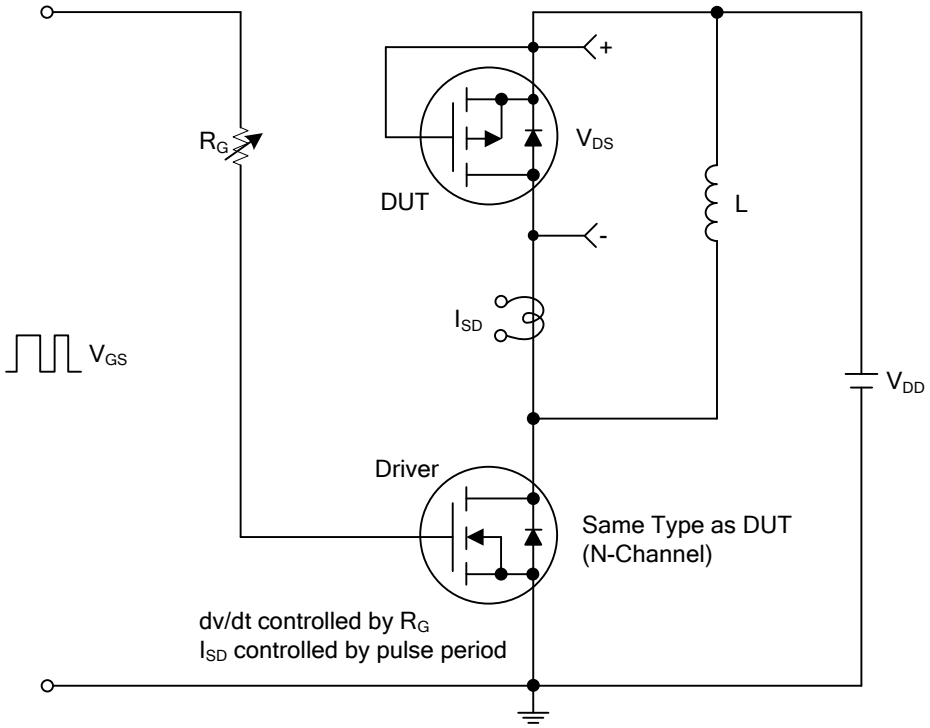
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

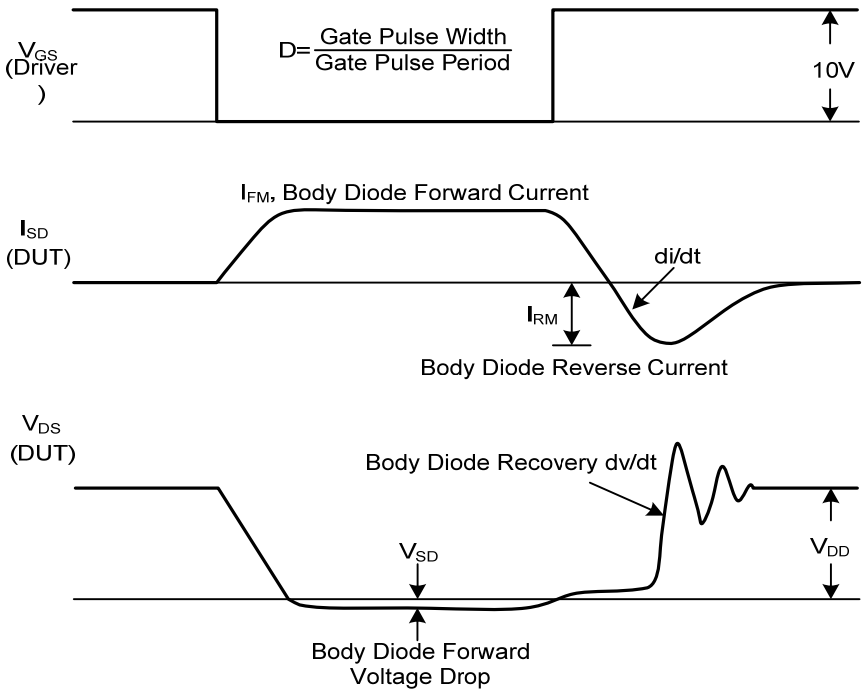
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS}=0V, I_D=250μA	-60			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=-60V, V_{GS}=0V, T_J=25°C			-1	μA
			V_{DS}=-48V, V_{GS}=0V, T_J=150°C			-10	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{DS}=0V ,V_{GS}=+25V			+100	nA
	Reverse		V_{DS}=0V ,V_{GS}=-25V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}= V_{GS}, I_D=250μA	-2.0		-4.0	V
Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=-10V, I_D=-25A			48	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=-25V, f=1.0MHz		1450		pF
Output Capacitance		C_{OSS}			120		pF
Reverse Transfer Capacitance		C_{RSS}			99		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q_G	V_{DS}=-48V, V_{GS}=-10V, I_D=-25A		24		nC
Gate to Source Charge		Q_{GS}			5		nC
Gate to Drain Charge		Q_{GD}			7		nC
Turn-on Delay Time (Note 1)		$t_{D(ON)}$	V_{DD}=-50V, V_{GS}=-10V, I_D=-25A, R_G=3Ω		8		ns
Rise Time		t_R			18		ns
Turn-off Delay Time		$t_{D(OFF)}$			28		ns
Fall-Time		t_F			19		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Pulsed Current		I_S				-25	A
Drain-Source Diode Forward Voltage (Note 1)		I_{SM}				-50	A
Maximum Body-Diode Continuous Current		V_{SD}	I_S =-1.0A, V_{GS}=0V			-1.0	V
Body Diode Reverse Recovery Time		t_{RR}	I_F=-25A, di/dt=100A/μs		33		ns
Body Diode Reverse Recovery Charge		Q_{RR}			20		ns

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

■ TEST CIRCUITS AND WAVEFORMS

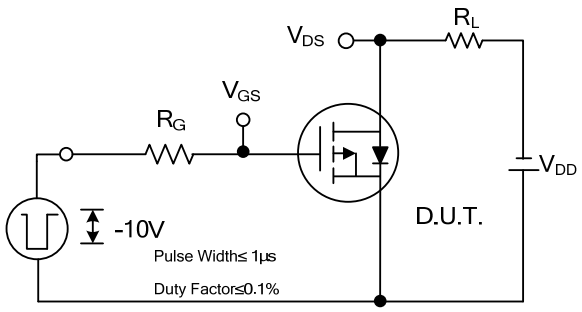


Peak Diode Recovery dv/dt Test Circuit

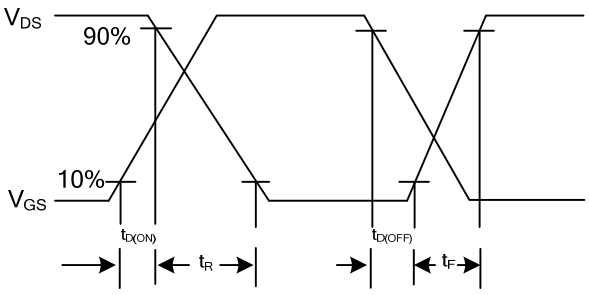


Peak Diode Recovery dv/dt Waveforms

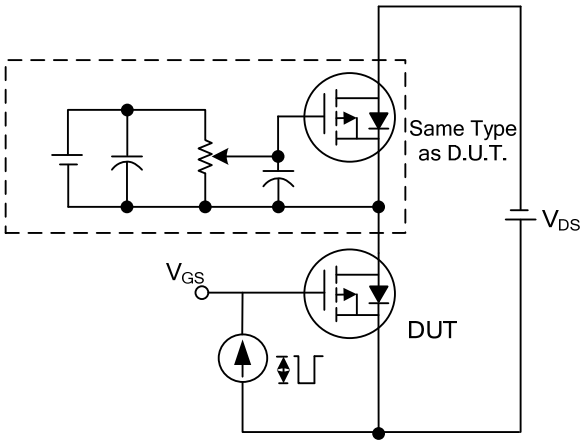
■ TEST CIRCUITS AND WAVEFORMS



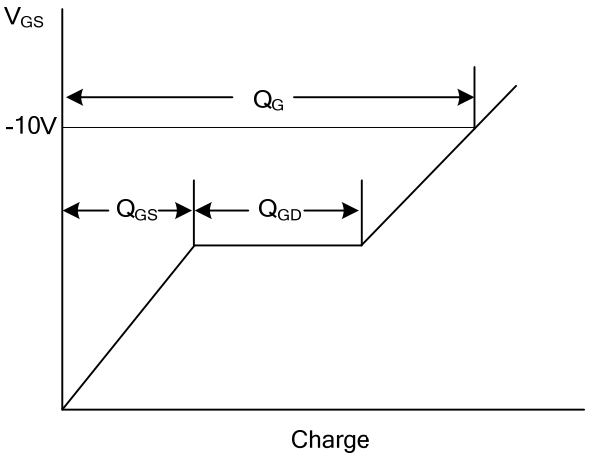
Switching Test Circuit



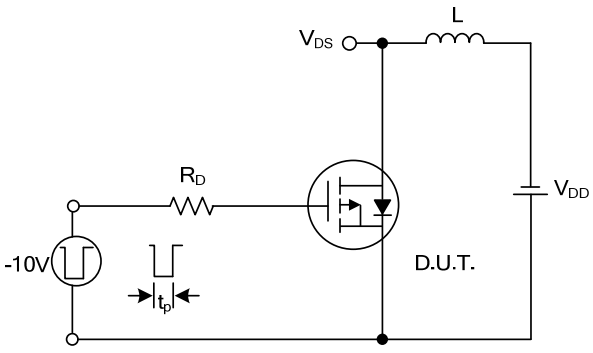
Switching Waveforms



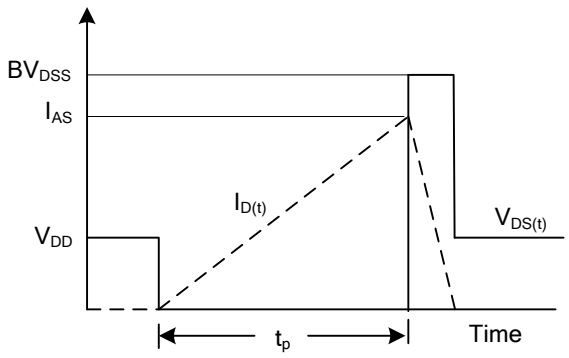
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms