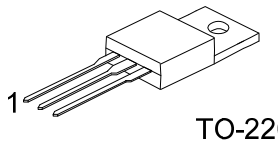
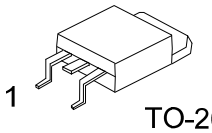
UT120P06H

Preliminary | ***Power MOSFET***

-120A, -60V P-CHANNEL POWER MOSFET



TO-220



TO-263

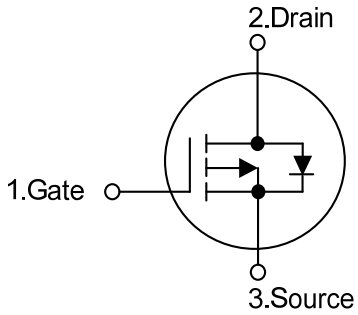
■ DESCRIPTION

The UTC **UT120P06H** provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

■ FEATURES

* $R_{DS(ON)} \leq$ 6.5 mΩ @ V_{GS}= -10V, I_D= -60A
* 100% Avalanche Tested

■ SYMBOL



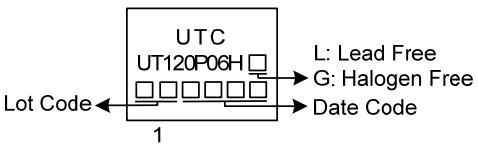
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT120P06HL-TA3-T	UT120P06HG-TA3-T	TO-220	G	D	S	Tube
UT120P06HL-TQ2-T	UT120P06HG-TQ2-T	TO-263	G	D	S	Tube
UT120P06HL-TQ2-R	UT120P06HG-TQ2-R	TO-263	G	D	S	Tape Reel

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

UT120P06HG-TA3-T (1)Packing Type (2)Package Type (3)Green Package	(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TQ2: TO-263 (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}	±20	V
Drain Current	Continuous, V_{GSS}@-10V	T_C=25°C	I_D	-120	A
		T_C=100°C		-78	A
	Pulsed (Note 2)		I_{DM}	-240	A
Avalanche Energy	Repetitive (Note 3)		E_{AS}	577	mJ
Peak Diode Recovery dv/dt (Note 4)			dv/dt	1.1	V/ns
Power Dissipation (T_C=25°C)			P_D	224	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} = -107A, V_{DD} = -50V, R_G = 25Ω, Starting T_J = 25°C
4. I_{SD} ≤ -30A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62.5	°C/W
Junction to Case	θ_{JC}	0.56 (Note)	°C/W

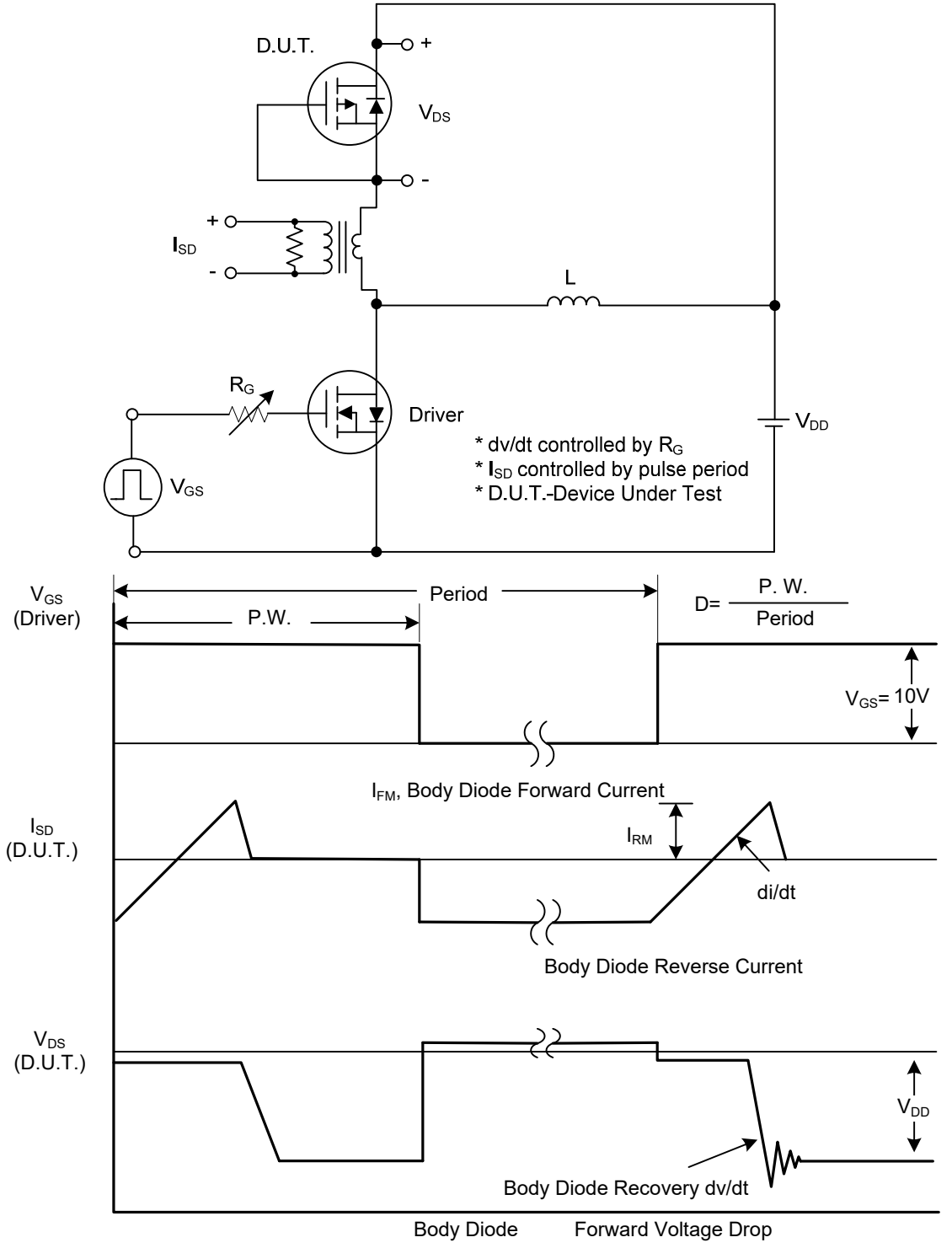
Note: Device mounted on FR-4 substrate P_C board, 2oz copper, with 1inch square copper plate.

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

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=-250μA, V_{GS}=0V	-60			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=-60V, V_{GS}=0V			-1	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	-2.0		-4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=-10V, I_D=-60A			6.5	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{DS}=-25V, V_{GS}=0V, f=1MHz		13		nF
Output Capacitance		C_{OSS}			1145		pF
Reverse Transfer Capacitance		C_{RSS}			893		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{DS}=-48V, V_{GS}=-10V, I_D=-120A		218		nC
Gate to Source Charge		Q_{GS}			31		nC
Gate to Drain ("Miller") Charge		Q_{GD}			23		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DD} =-30V, V_{GS}=-10V, I_D=-120A, R_G=3Ω (Note 1, 2)		30		ns
Rise Time		t_R			30		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			157		ns
Fall-Time		t_F			77		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				-120	A
Maximum Body-Diode Pulsed Current (Note 1)		I_{SM}				-240	A
Drain-Source Diode Forward Voltage		V_{SD}	I_S=-120A, V_{GS}=0V (Note 2)			-1.4	V
Body Diode Reverse Recovery Time (Note 1)		t_{rr}	I_F=-30A, V_{GS}=0V, dI_F/dt=100A/μs		126		ns
Body Diode Reverse Recovery Charge		Q_{rr}			395		nC

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

■ TEST CIRCUITS AND WAVEFORMS



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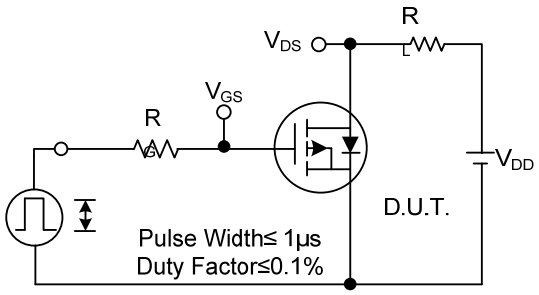
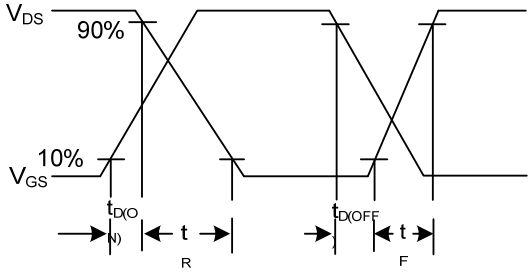
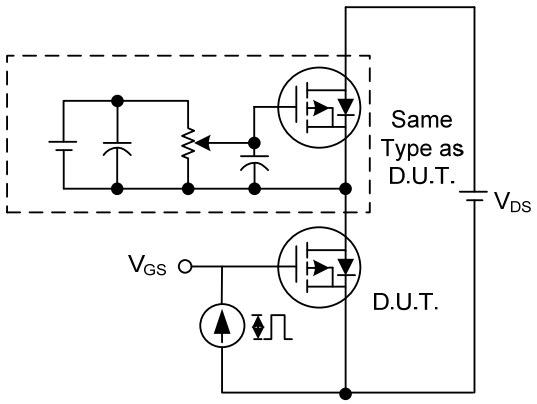


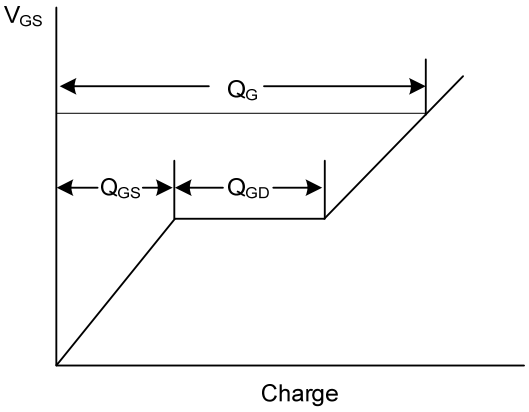
Switching Test Circuit



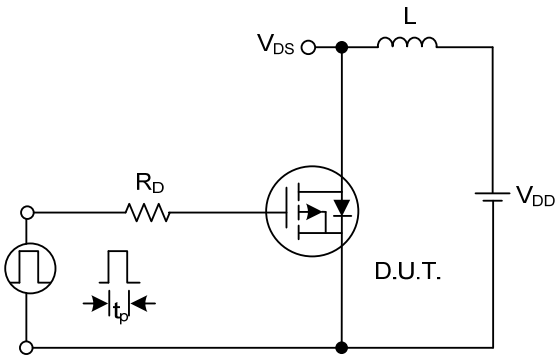
Switching Waveforms



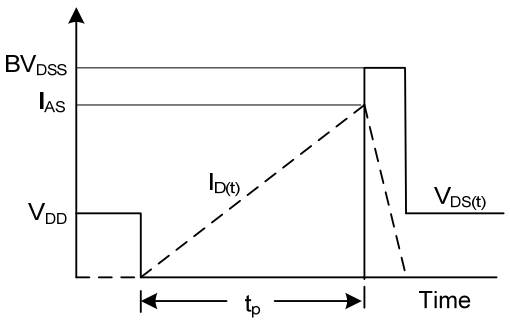
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms