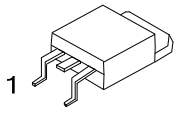
UT70P10H

Preliminary ***POWER MOSFET***

-70A, -100V P-CHANNEL POWER MOSFET



TO-252

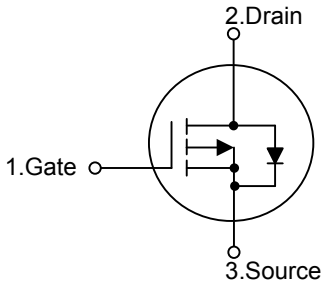
■ DESCRIPTION

The **UT70P10H** uses advanced proprietary, planar stripe, DMOS technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable to be used in low voltage applications such as audio amplifier, high efficiency switching DC/DC converters, and DC motor control.

■ FEATURES

* $R_{DS(ON)} \leq 38\ m\Omega$ @ V_{GS}=-10V, I_D=-35A
* High Switching Speed
* High Cell Density Trench Technology

■ SYMBOL



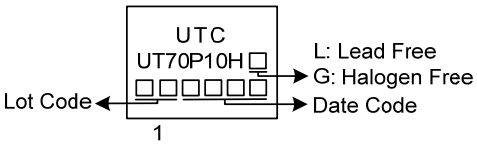
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT70P10HL-TN3-R	UT70P10HG-TN3-R	TO-252	G	D	S	Tape Reel

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

UT70P10HG-TN3-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) 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}	-100	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current	I_D	-70	A
Pulsed Drain Current (Note 2)	I_{DM}	-140	A
Single Pulsed Avalanche Energy (Note 3)	E_{AS}	202	mJ
Peak Diode Recovery dv/dt	dv/dt	3.7	V/ns
Power Dissipation	P_D	60	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} = -63.6A, 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	RATING	UNIT
Junction to Ambient	θ_{JA}	110	°C/W
Junction to Case	θ_{JC}	2.08 (Note)	°C/W

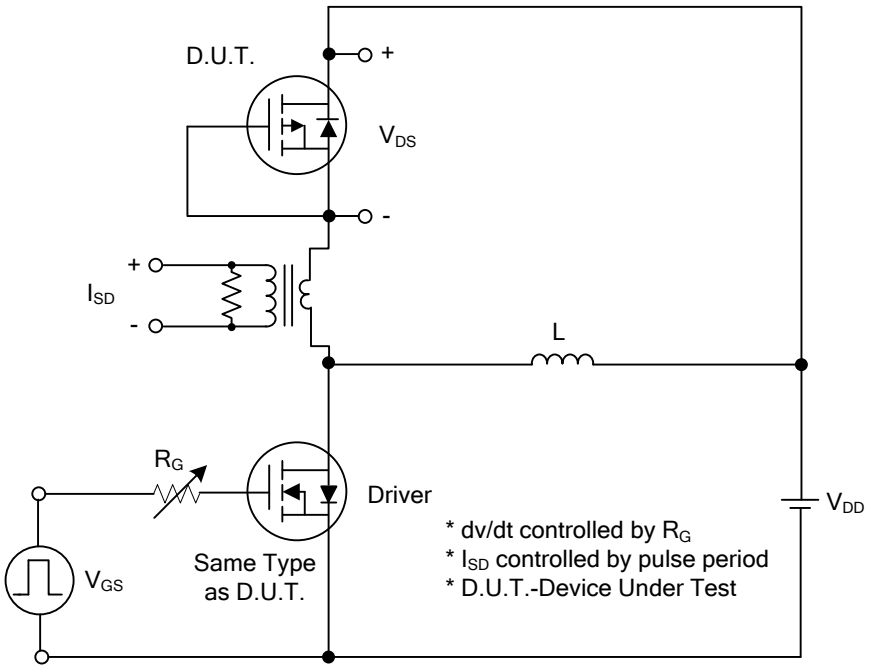
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

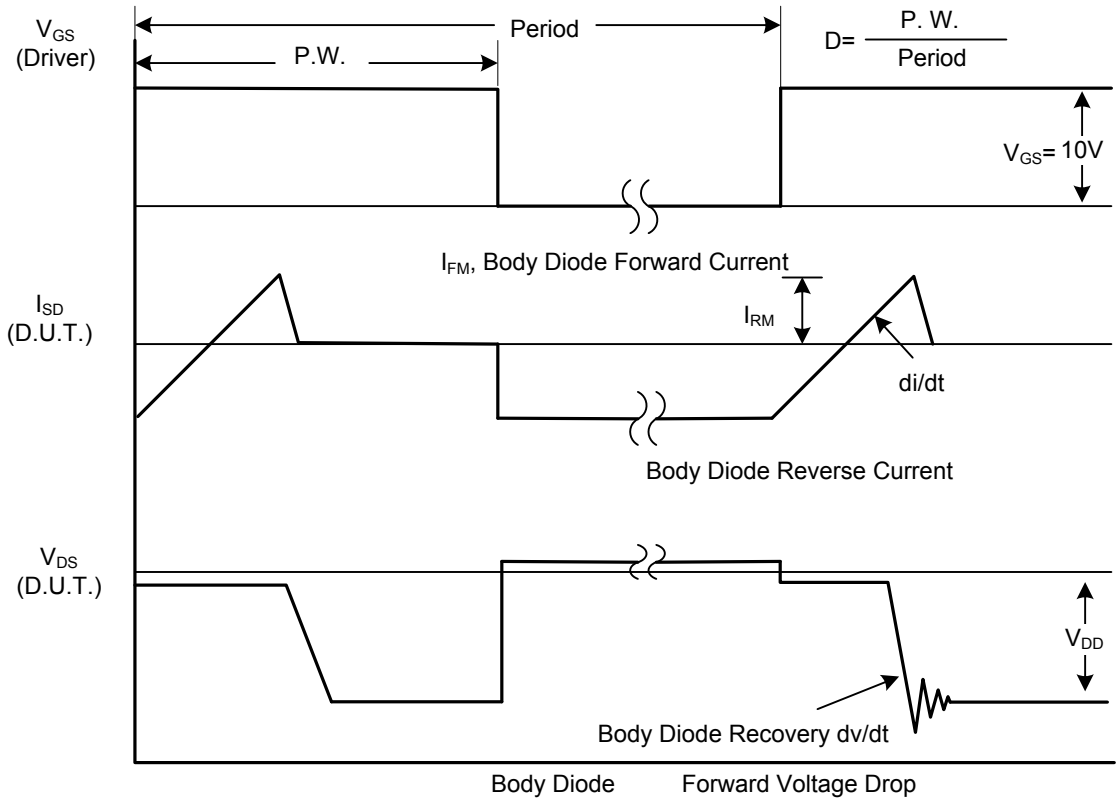
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0 V, I_D=-250μA	-100			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-100V, V_{GS}=0V			-1	μA
		V_{DS}=-100V, T_C=125°C			-10	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±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-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-35A			38	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=-25V, V_{GS}=0V, f=1.0MHz		8550		pF
Output Capacitance	C_{OSS}			375		pF
Reverse Transfer Capacitance	C_{RSS}			275		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DS}=-80V, V_{GS}=-10V, I_D=-70A (Note 1, 2)		115		nC
Gate Source Charge	Q_{GS}			27		nC
Gate Drain Charge	Q_{GD}			29		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{DD}=-50V, V_{GS}=-10V, I_D=-70A, R_G=3Ω (Note 1, 2)		22		ns
Turn-ON Rise Time	t_R			23		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			98		ns
Turn-OFF Fall-Time	t_F			34		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				-70	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				-140	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-70A			-1.4	V
Body Diode Reverse Recovery Time	t_{rr}	V_{GS}= 0V, I_S=-30A, dI_F/dt=100A/μs (Note 1)		60		ns
Body Diode Reverse Recovery Charge	Q_{rr}			135		nC

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

■ TEST CIRCUITS AND WAVEFORMS

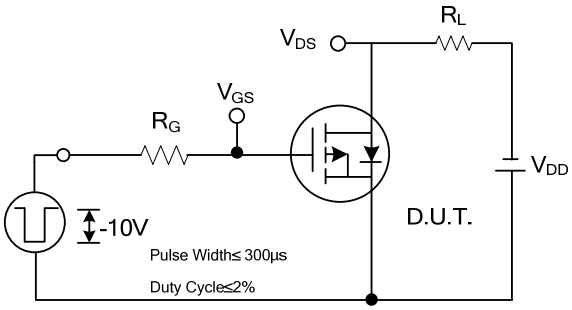


Peak Diode Recovery dv/dt Test Circuit

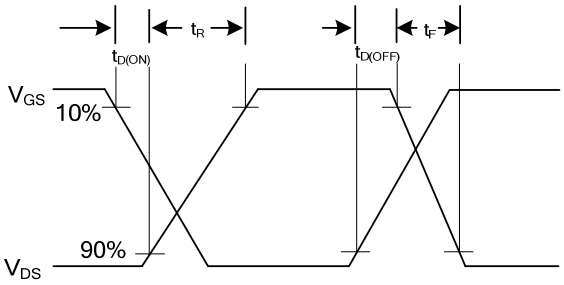


Peak Diode Recovery dv/dt Waveforms

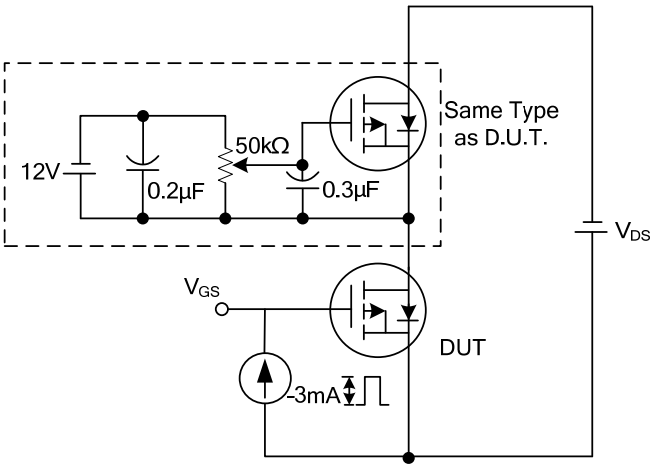
■ TEST CIRCUITS AND WAVEFORMS



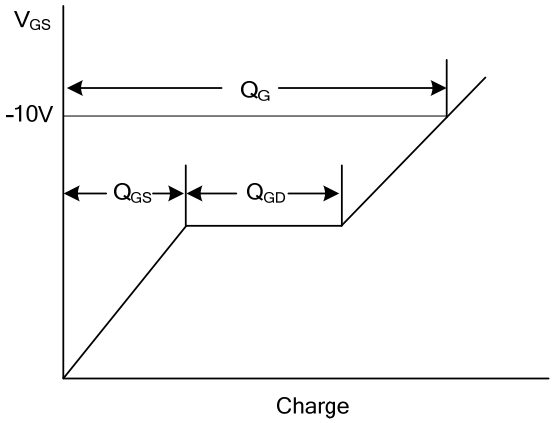
Switching Test Circuit



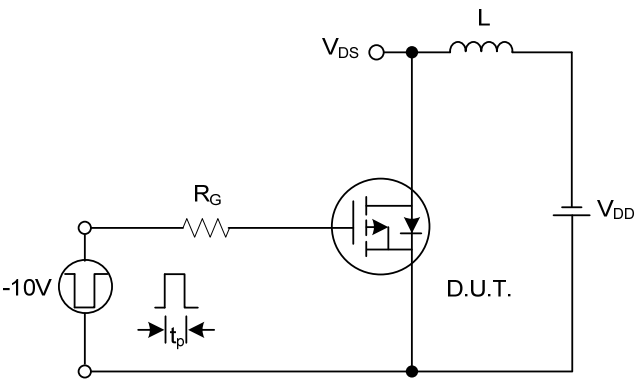
Switching Waveforms



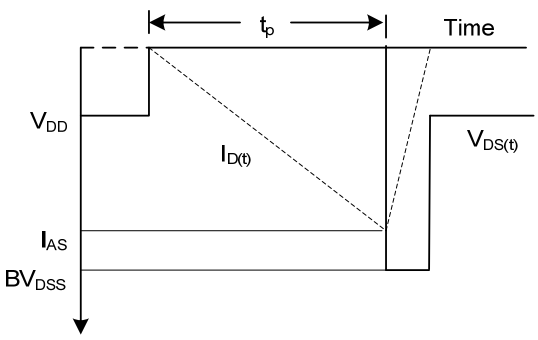
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms