



UT10P06

Power MOSFET

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

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.

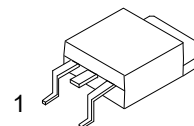
FEATURES

* $R_{DS(ON)} \leq 120 \text{ m}\Omega$ @ $V_{GS} = -10\text{V}$, $I_D = -2.5\text{A}$

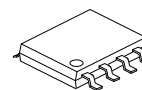
$R_{DS(ON)} \leq 160 \text{ m}\Omega$ @ $V_{GS} = -4.5\text{V}$, $I_D = -2.5\text{A}$

* Improved dv/dt capability

* Fast switching

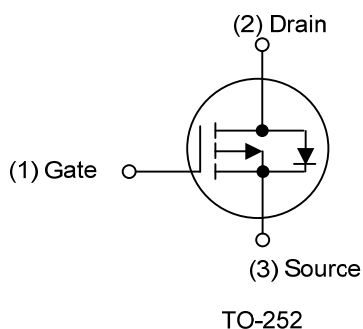


TO-252

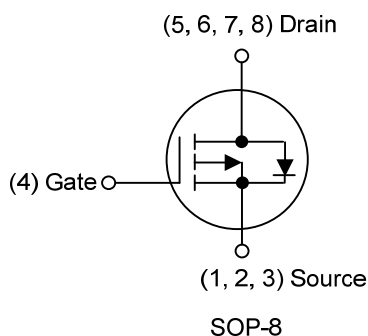


SOP-8

SYMBOL



TO-252



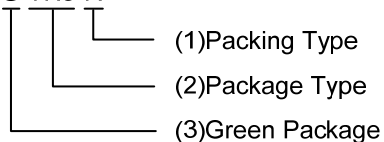
SOP-8

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

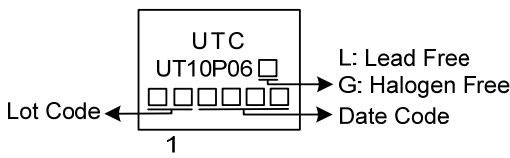
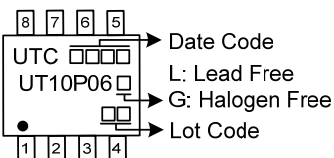


(1) R: Tape Reel

(2) TN3: TO-252, S08: SOP-8

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

■ MARKING

TO-252	SOP-8
 UTC UT10P06 □ □ □ □ □ □ 1 Lot Code ← → L: Lead Free → G: Halogen Free → Date Code	 8 7 6 5 UTC □ □ □ □ UT10P06 □ ● □ □ 1 2 3 4 → Date Code → L: Lead Free → G: Halogen Free → Lot Code

■ ABSOLUTE MAXIMUM RATINGS ($T_c=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	± 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	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

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. $L = 0.1\text{mH}$, $I_{AS} = -13\text{A}$, $V_{DD} = -50\text{V}$, $R_G = -25\Omega$, Starting $T_J = 25^{\circ}\text{C}$

4. $I_{SD} \leq -10\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DS}$, Starting $T_J = 25^{\circ}\text{C}$

■ THERMAL DATA

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

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

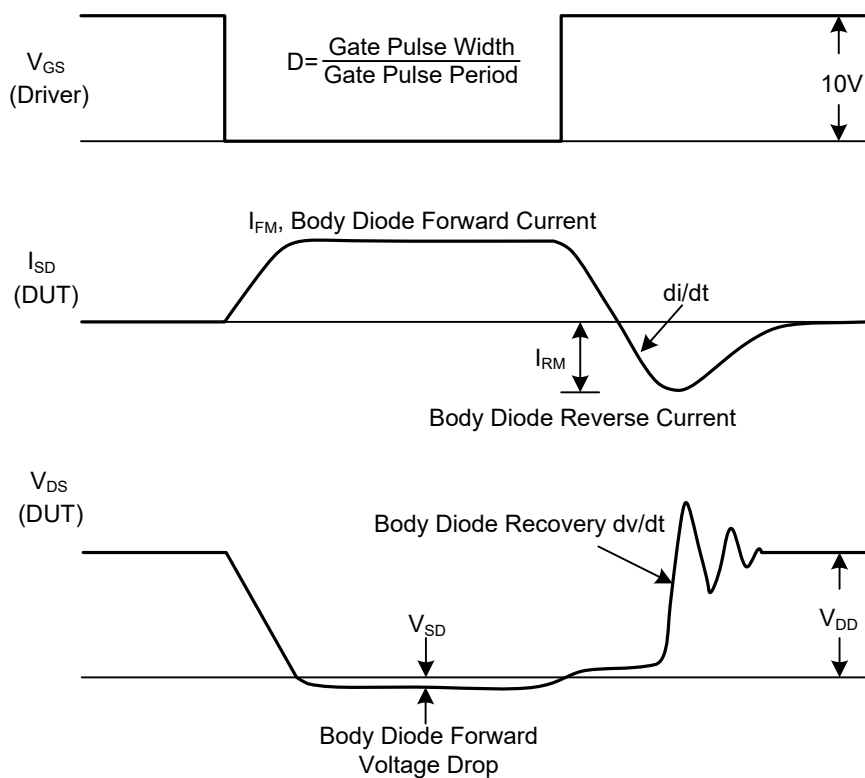
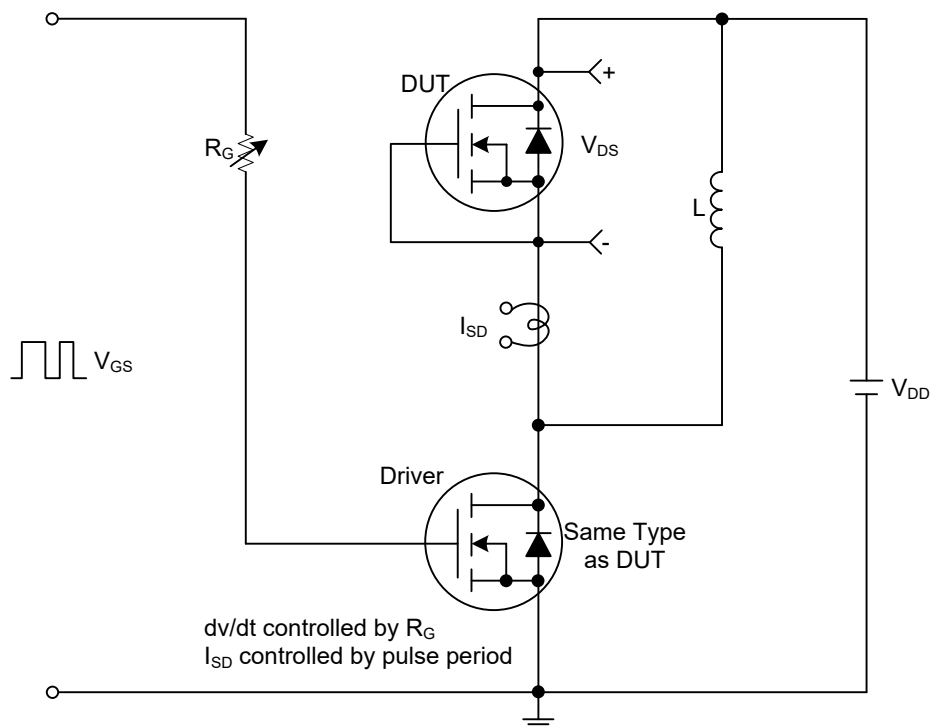
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

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,		50		nS
Reverse Recovery Charge	Q _{rr}	dI _F /dt =100A/μs		35		nC

Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

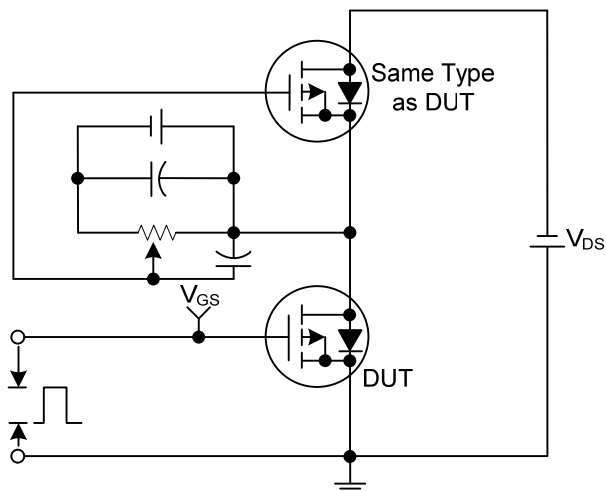
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

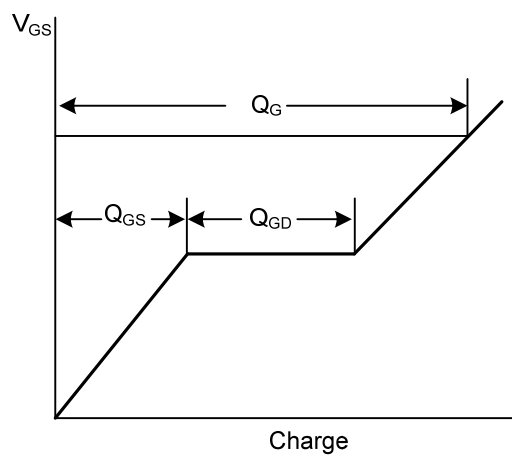


Peak Diode Recovery dv/dt Test Circuit and Waveforms

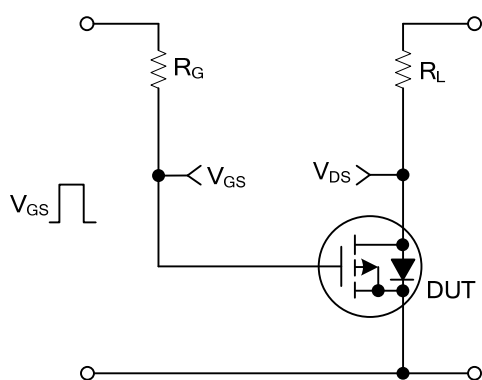
■ TEST CIRCUITS AND WAVEFORMS



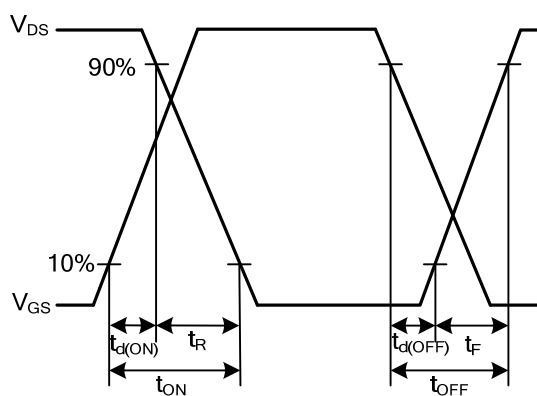
Gate Charge Test Circuit



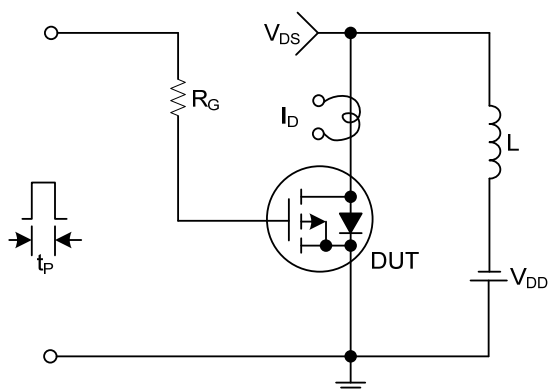
Gate Charge Waveforms



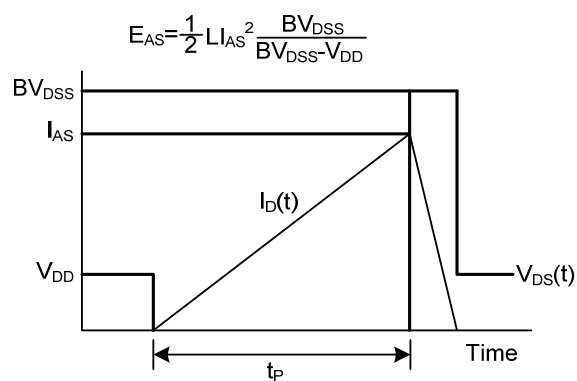
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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