



UT36P15

Power MOSFET

-36A, -150V P-CHANNEL POWER MOSFET

DESCRIPTION

The UTC **UT36P15** is a P-channel power MOSFET using UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance, and it can also withstand high energy in the avalanche.

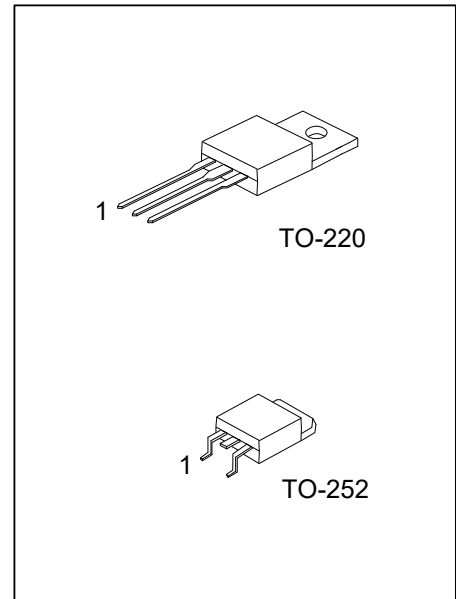
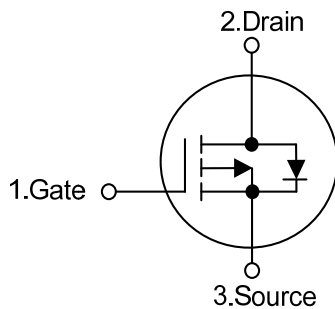
This UTC **UT36P15** is suitable for motor drivers, high-side switch and 12V board net, etc.

FEATURES

* $R_{DS(ON)} \leq 110 \text{ m}\Omega$ @ $V_{GS} = -10V$, $I_D = -18A$

* High Switching Speed

SYMBOL



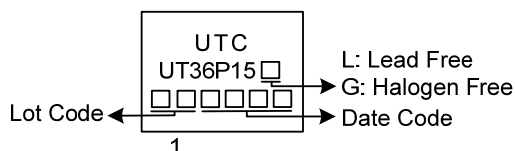
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT36P15L-TA3-T	UT36P15G-TA3-T	TO-220	G	D	S	Tube
UT36P15L-TN3-R	UT36P15G-TN3-R	TO-252	G	D	S	Tape Reel

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

UT36P15G-TA3-T (1) Packing Type (2) Package Type (3) Green Package		(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TN3: TO-252 (3) G: Halogen Free and Lead Free L: Lead Free
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MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_c=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DSS}	-150	V
Gate-Source Voltage		V _{GSS}	±20	V
Drain Current	Continuous	I _D	-36	A
	Pulsed	I _{DM}	-72	A
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	64	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	18.6	V/ns
Power Dissipation	TO-220	P _D	130	W
	TO-252		50	W
Junction Temperature		T _J	-55 ~ +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} = -36A, V_{DD} = -50V, R_G = 25 Ω 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	TO-220	θ _{JA}	62.5	°C/W
	TO-252		110	°C/W
Junction to Case	TO-220	θ _{JC}	0.96	°C/W
	TO-252		2.5 (Note)	°C/W

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

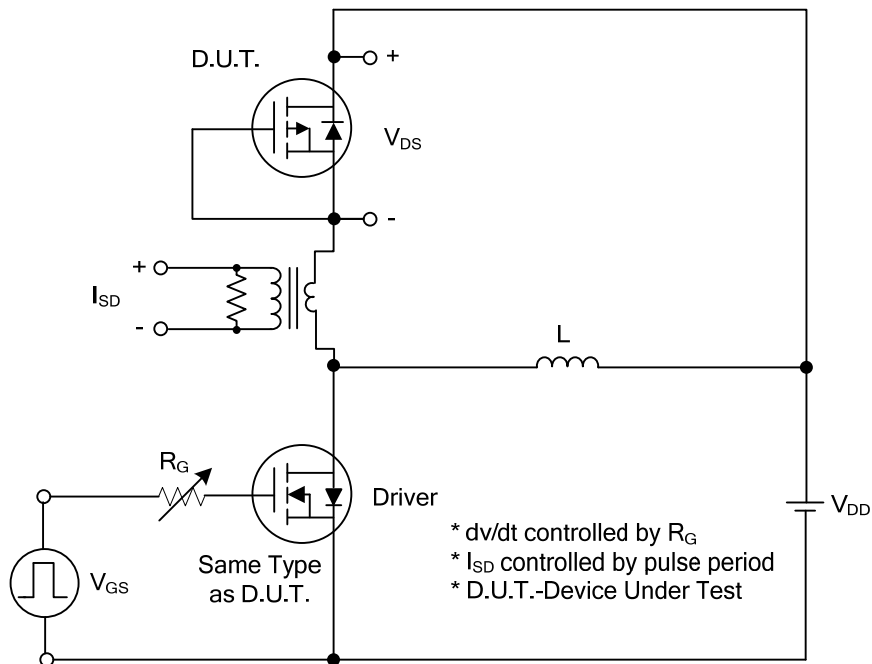
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =-250μA, V _{GS} =0V	-150			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =-150V, 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		-4.5	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =-10V, I _D =-18A			110	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{DS} =-25V, V _{GS} =0V, f=1MHz		6450		pF
Output Capacitance		C _{OSS}			265		pF
Reverse Transfer Capacitance		C _{RSS}			212		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =-120V, V _{GS} =-10V, I _D =-36A (Note 1, 2)		98		nC
Gate to Source Charge		Q _{GS}			31		nC
Gate to Drain Charge		Q _{GD}			32		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DS} =-100V, V _{GS} =-10V, I _D =-36A, R _G =3Ω (Note 1, 2)		25		ns
Rise Time		t _R			21		ns
Turn-OFF Delay Time		t _{D(OFF)}			78		ns
Fall-Time		t _F			27		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				-36	A
Maximum Body-Diode Pulsed Current		I _{SM}				-72	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =-36A, V _{GS} =0V			1.4	V
Reverse Recovery Time (Note 1)		t _{rr}	I _S =-30A, V _{GS} =0V		100		ns
Reverse Recovery Charge		Q _{rr}	dl _F /dt=100A/μs (Note1)		0.4		μC

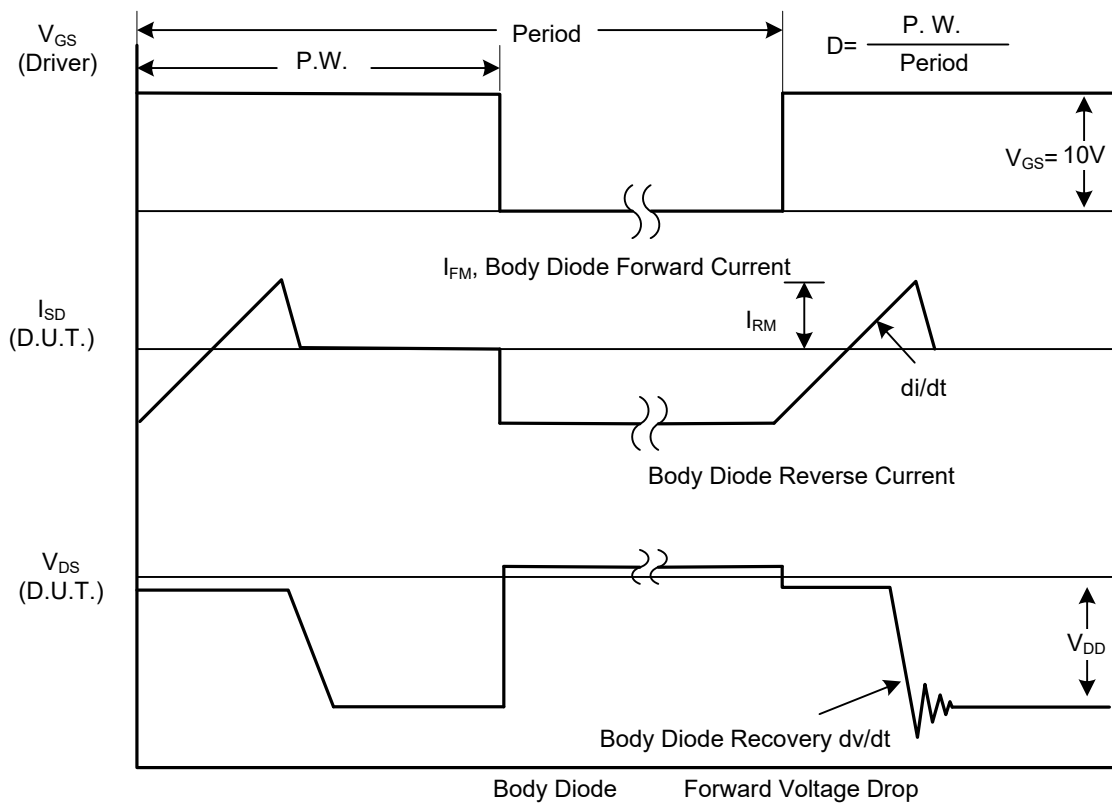
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

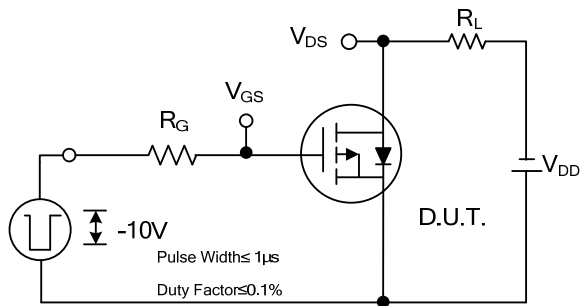


Peak Diode Recovery dv/dt Test Circuit

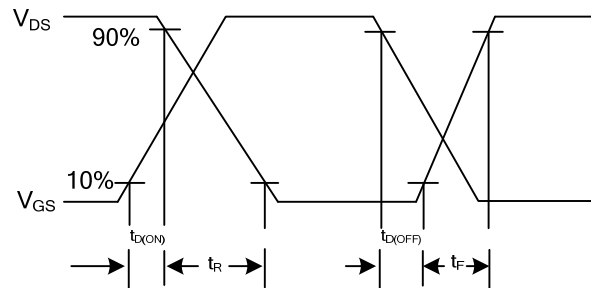


Peak Diode Recovery dv/dt Waveforms

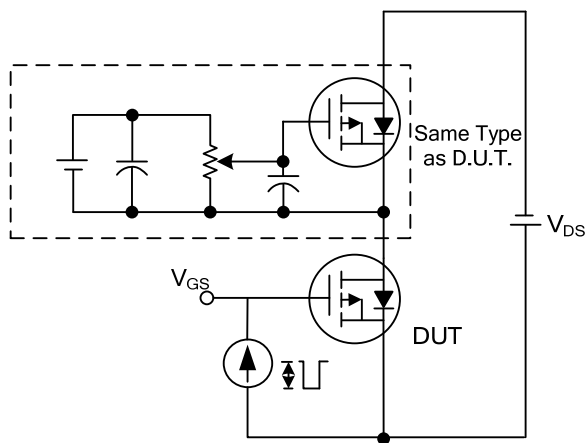
■ TEST CIRCUITS AND WAVEFORMS



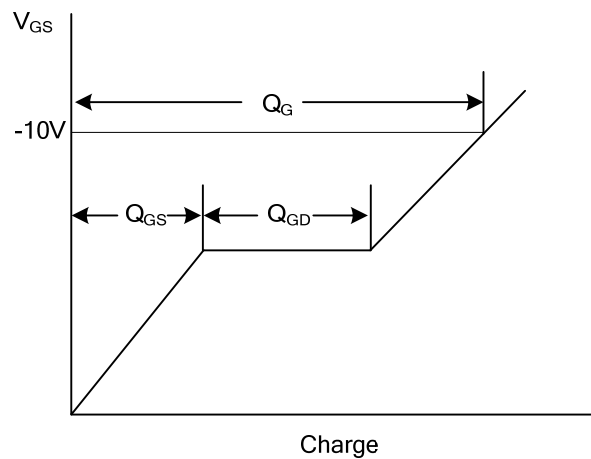
Switching Test Circuit



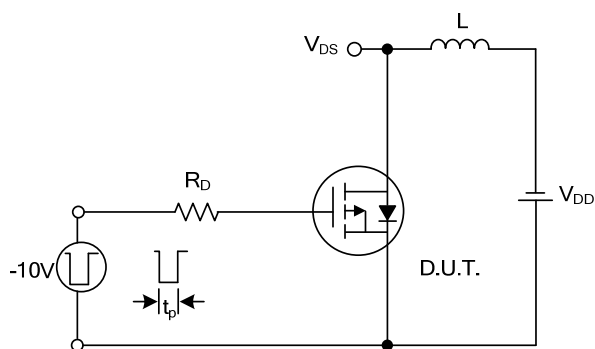
Switching Waveforms



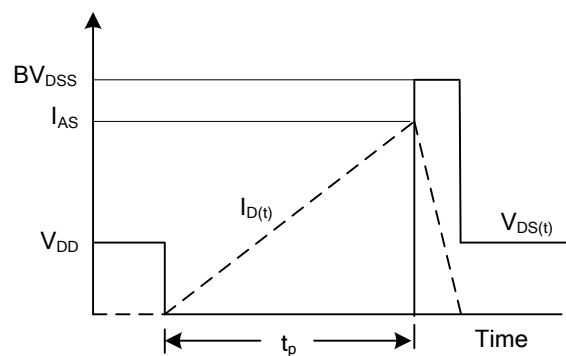
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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