



UF1010-S

Preliminary

Power MOSFET

84A, 60V N-CHANNEL POWER MOSFET

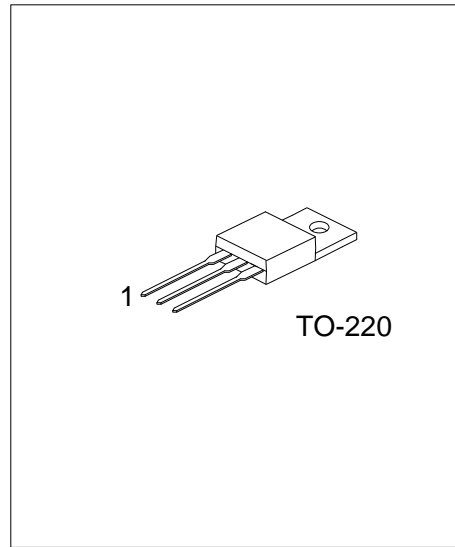
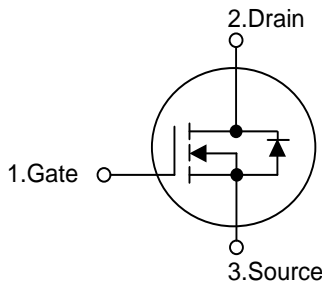
DESCRIPTION

The UTC UF1010-S is a N-channel mode power MOSFET and is designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and high rugged avalanche characteristics. This power MOSFET is usually used in high speed switching applications at power supplies, PWM motor controls, high efficient AC to DC converters and bridge circuits.

FEATURES

- * $R_{DS(ON)} \leq 12 \text{ m}\Omega @ V_{GS} = 10V, I_D = 50A$
- * Fast Switching Capability
- * Improved dv/dt Capability, High Ruggedness

SYMBOL



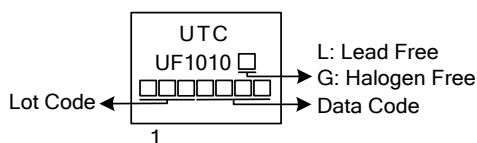
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UF1010L-TA3-T	UF1010G-TA3-T	TO-220	G	D	S	Tube

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

<p>UF1010G-TA3-T</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) T: Tube (2) TA3: TO-220 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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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	I _D	84	A
	Pulsed (Note 2)	I _{DM}	330	A
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	490	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	11	V/ns
Power Dissipation		P _D	200	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 = 0.1 mH, I_{AS} = 99 A, 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

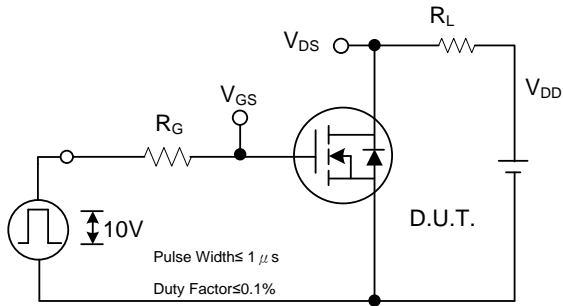
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ _{JA}	62	°C/W
Junction to Case	θ _{JC}	0.75	°C/W

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

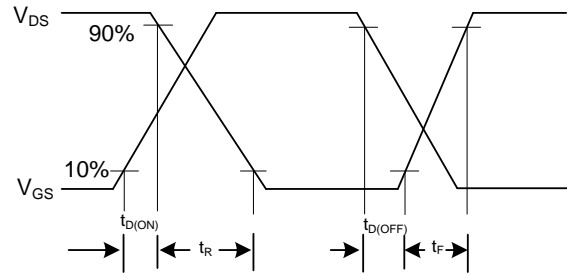
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	60			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	Forward	I _{GSS} V _{GS} =20V, V _{DS} =0V V _{GS} =-20V, V _{DS} =0V			100	nA
	Reverse				-100	
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 =50A			12	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		3385		pF
Output Capacitance	C _{OSS}			580		pF
Reverse Transfer Capacitance	C _{RSS}			80		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge (Note 1)	Q _G	V _{DS} =50V, V _{GS} =10V, I _D =1.3A, I _G =100μA (Note 1, 2)		224		nC
Gate to Source Charge	Q _{GS}			14.7		nC
Gate to Drain Charge	Q _{GD}			21.6		nC
Turn-ON Delay Time (Note 1)	t _{D(ON)}	V _{DD} =30V, V _{GS} =10V, I _D =0.5A, R _G =25Ω (Note 1, 2)		60		ns
Rise Time	t _R			105		ns
Turn-OFF Delay Time	t _{D(OFF)}			1180		ns
Fall-Time	t _F			345		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				84	A
Maximum Body-Diode Pulsed Current	I _{SM}				330	A
Drain-Source Diode Forward Voltage (Note 1)	V _{SD}	I _S =30A, V _{GS} =0V			1.3	V
Body Diode Reverse Recovery Time (Note 1)	t _{rr}	I _S =30A, V _{GS} =0V, dI _F /dt=100A/μs		55		ns
Body Diode Reverse Recovery Charge	Q _{rr}				102	

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

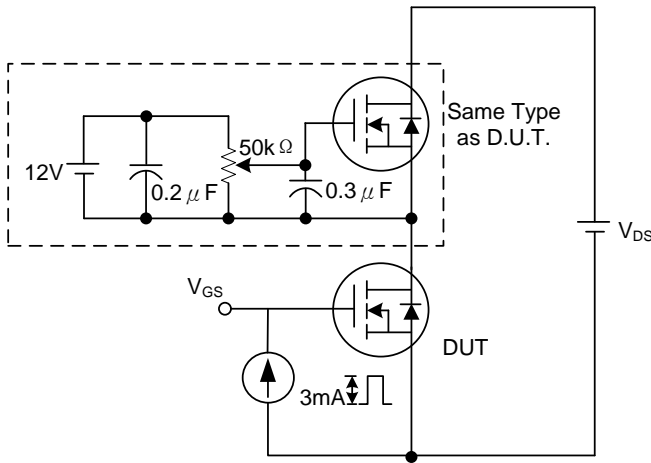
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



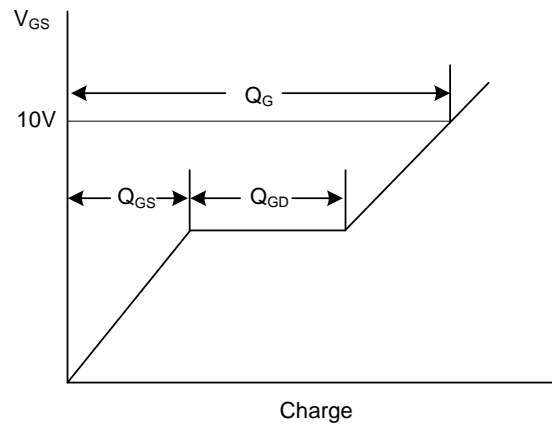
Switching Test Circuit



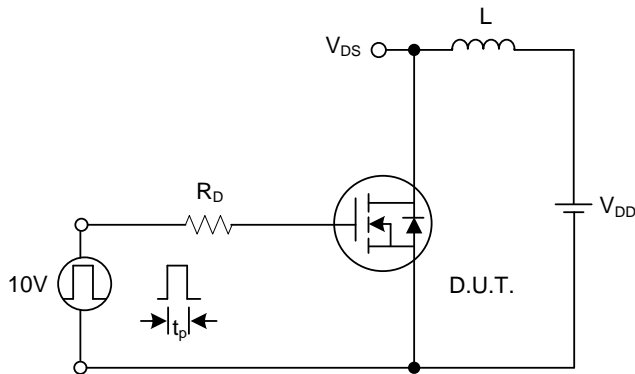
Switching Waveforms



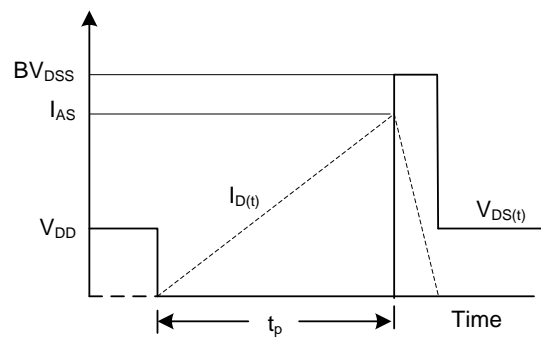
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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