

**UF634**

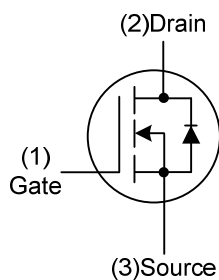
Preliminary

Power MOSFET**ADVANCED POWER MOSFET****DESCRIPTION**

The UTC **UF634** is a N-channel Power MOSFET and it uses UTC advanced technology to provide customers with lower $R_{DS(ON)}$, improved gate charge and so on.

FEATURES

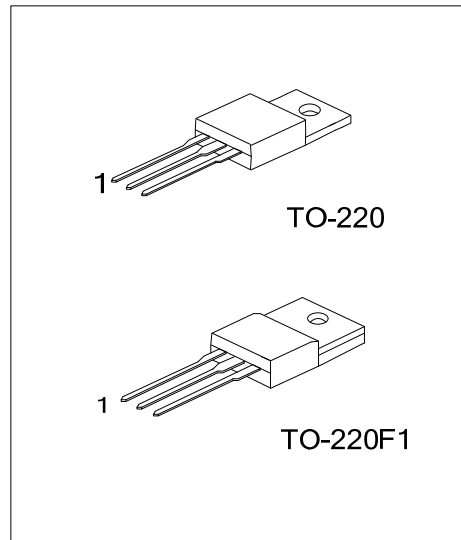
- * Lower Input Capacitance
- * Improved Gate Charge
- * Lower Leakage Current: 10 μ A (MAX.) @ $V_{DS} = 250V$
- * Avalanche Rugged Technology
- * Rugged Gate Oxide Technology
- * Extended Safe Operating Area

SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UF634L-TA3-T	UF634G-TA3-T	TO-220	G	D	S	Tube
UF634L-TF1-T	UF634G-TF1-T	TO-220F1	G	D	S	Tube

Note: G: Gain, D: Drain, S: Source

UF634L-TA3-T	(1) Packing Type	(1) T: Tube
	(2) Package Type	(2) TA3: TO-220, TF1: TO-220F1
	(3) Lead Free	(3) G: Halogen Free, L: Lead Free



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

PARAMETER		SYMBOL	RATINGS	UNIT
Gate-to-Source Voltage		V_{GS}	± 30	V
Drain-to-Source Voltage		V_{DSS}	250	V
Continuous Drain Current	$T_C=25^{\circ}\text{C}$	I_D	8.1	A
	$T_C=100^{\circ}\text{C}$		5.1	
Drain Current-Pulsed (Note 2)		I_{DM}	32	A
Avalanche Current (Note 2)		I_{AR}	8.1	A
Single Pulsed Avalanche Energy (Note 3)		E_{AS}	205	mJ
Repetitive Avalanche Energy (Note 2)		E_{AR}	7.4	mJ
Power Dissipation	TO-220	P_D	74	W
	TO-220F1		38	W
Operating Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-55~+150	$^{\circ}\text{C}$

Note: 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. $L=5\text{mH}$, $I_{AS}=8.1\text{A}$, $V_{DD}=50\text{V}$, $R_G=27\ \Omega$, Starting $T_J=25^{\circ}\text{C}$
4. $I_{SD} \leq 8.1\text{A}$, $di/dt \leq 210\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J=25^{\circ}\text{C}$

■ THERMAL RESISTANCE

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/ TO-220F1	θ_{JA}	62.5	$^{\circ}\text{C}/\text{W}$
Junction to Case	TO-220	θ_{JC}	1.69	$^{\circ}\text{C}/\text{W}$
	TO-220F1		3.29	$^{\circ}\text{C}/\text{W}$

■ ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$, unless otherwise specified)

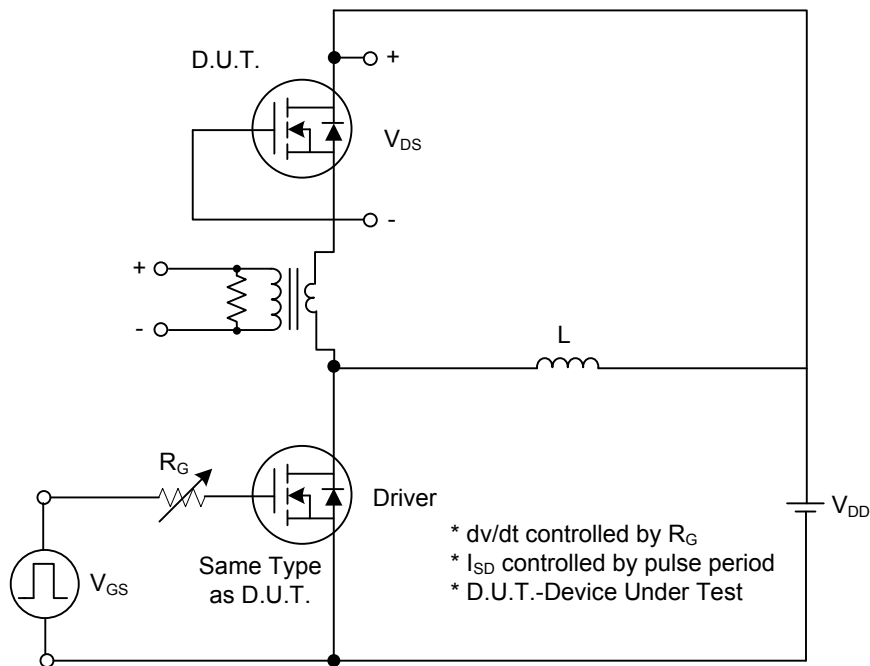
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	250			V
Breakdown Voltage Temperature Coefficient	ΔBV/ΔT _J	I _D =250μA		0.29		V/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =250V			10	μA
		V _{DS} =200V, T _J =125°C			100	
Gate- Source Leakage Current	I _{GSS}	V _{GS} =±30V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =5V, I _D =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =-4.05A			0.45	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		730	950	pF
Output Capacitance	C _{OSS}			110	130	pF
Reverse Transfer Capacitance	C _{RSS}			50	60	pF
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{GS} =10V, V _{DS} =200V, I _D =8.1A (Note 1, 2)		30	40	nC
Gate to Source Charge	Q _{GS}			5.8		nC
Gate to Drain Charge	Q _{GD}			13.5		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =125V, I _D =8.1A, R _G =12Ω (Note 1, 2)		13	40	ns
Rise Time	t _R			14	40	ns
Turn-OFF Delay Time	t _{D(OFF)}			53	120	ns
Fall-Time	t _F			21	50	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage (Note 2)	V _{SD}	I _S =8.1A, V _{GS} =0V, T _J =25°C			1.5	V
Maximum Body-Diode Continuous Current	I _S	Integral reverse pn-diode in the MOSFET			8.1	A
Pulsed-Source Current (Note 1)	I _{SM}				32	A
Reverse Recovery Time (Note 2)	t _{RR}	di _F /dt=100A/μs, T _J =25°C, I _F =8.1A		190		ns
Reverse Recovery Charge (Note 2)	Q _{RR}			1.28		μC

Note: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

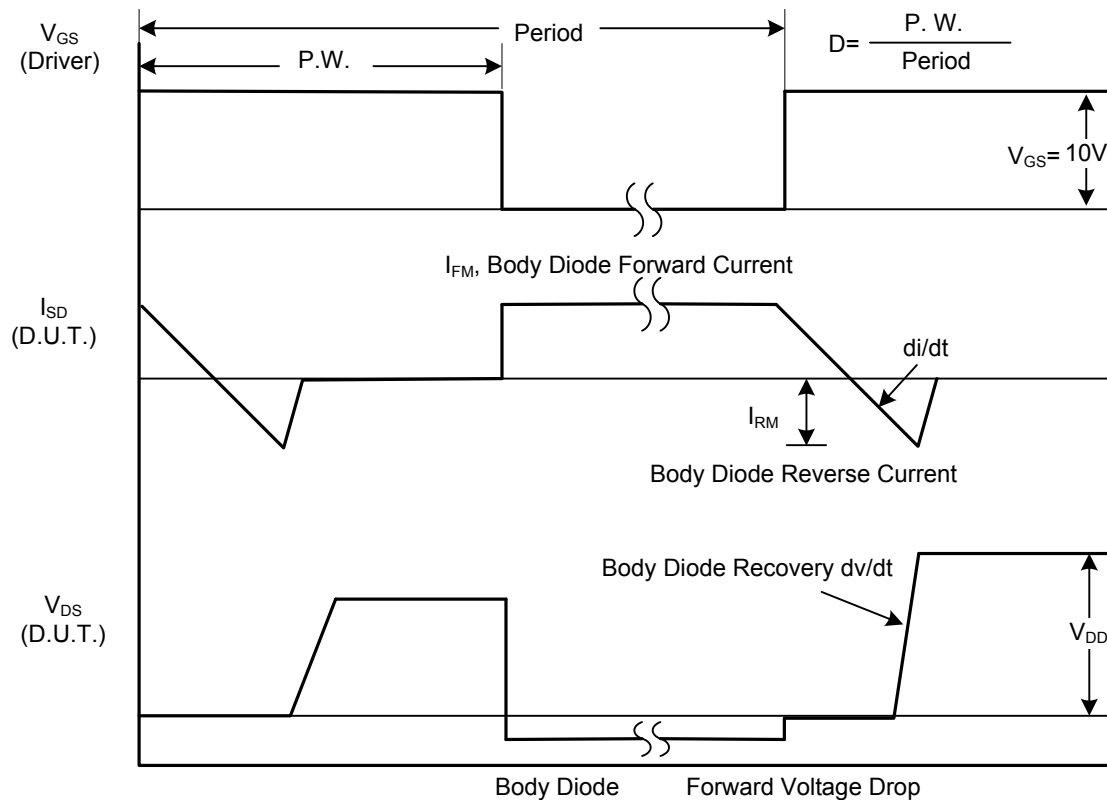
2. Pulse Test: Pulse Width = $250\mu\text{s}$, Duty Cycle $\leq 2\%$

3. Essentially Independent of Operating Temperature

■ TEST CIRCUITS AND WAVEFORMS

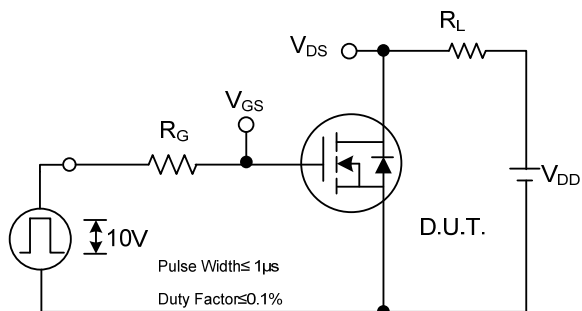


Peak Diode Recovery dv/dt Test Circuit

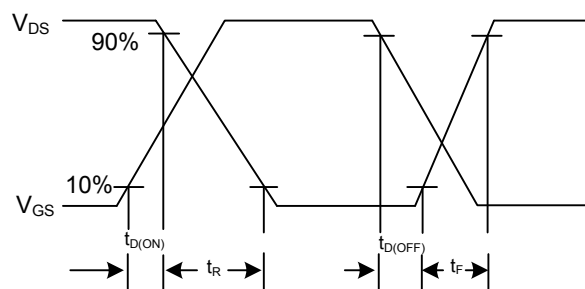


Peak Diode Recovery dv/dt Waveforms

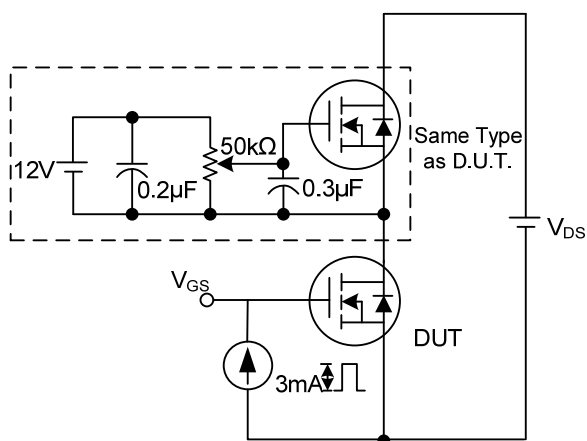
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



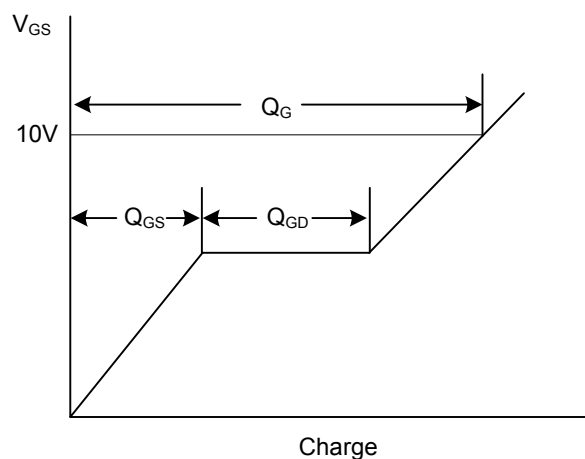
Switching Test Circuit



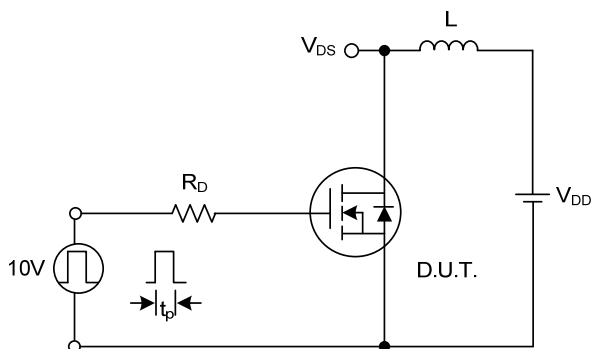
Switching Waveforms



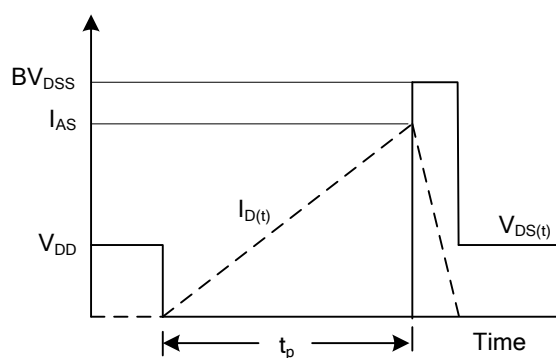
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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