



UF634

Preliminary

Power MOSFET

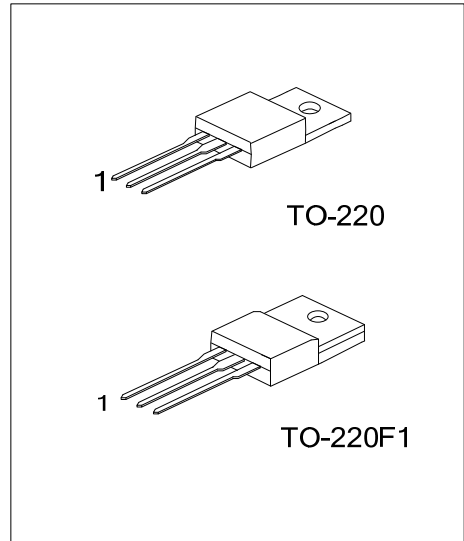
ADVANCED POWER MOSFET

■ DESCRIPTION

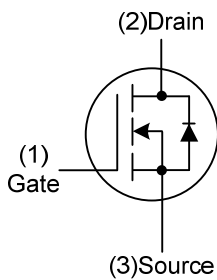
The UTC **UF634** is a N-channel Power MOSFET and it uses UTC advanced technology to provide customers with lower $R_{DS(ON)}$, improved gate charge and so on.

■ 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

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

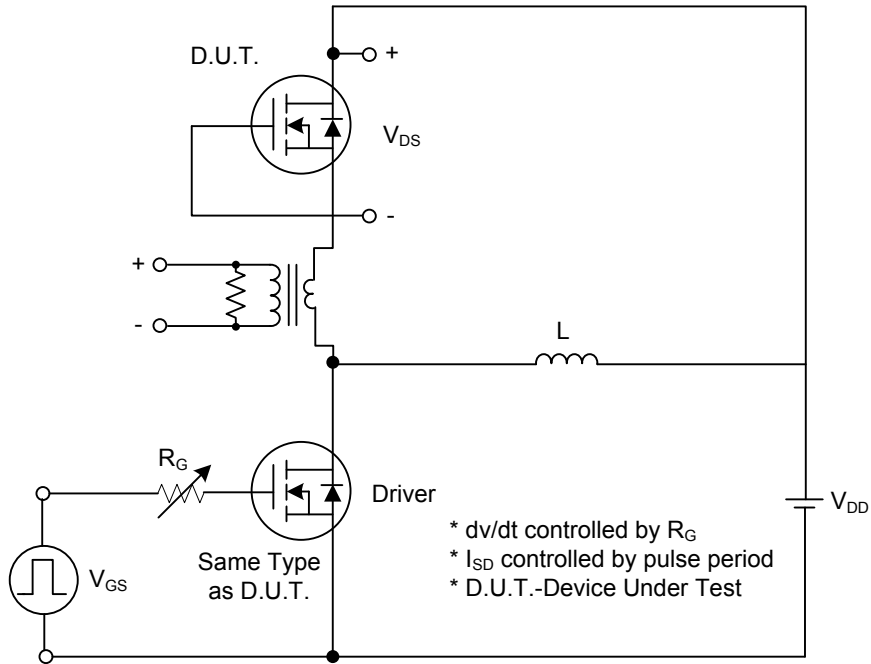
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	250			V
Breakdown Voltage Temperature Coefficient	$\Delta BV/\Delta T_J$	$I_D=250\mu\text{A}$		0.29		V/ $^\circ\text{C}$
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=250\text{V}$			10	μA
		$V_{DS}=200\text{V}$, $T_J=125^\circ\text{C}$			100	
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30\text{V}$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=5\text{V}$, $I_D=250\mu\text{A}$	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=4.05\text{A}$			0.45	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$		730	950	pF
Output Capacitance	C_{OSS}		110	130	pF	
Reverse Transfer Capacitance	C_{RSS}		50	60		
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{GS}=10\text{V}$, $V_{DS}=200\text{V}$, $I_D=8.1\text{A}$ (Note 1, 2)		30	40	nC
Gate to Source Charge	Q_{GS}		5.8		nC	
Gate to Drain Charge	Q_{GD}		13.5			
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=125\text{V}$, $I_D=8.1\text{A}$, $R_G=12\Omega$ (Note 1, 2)		13	40	ns
Rise Time	t_R		14	40		
Turn-OFF Delay Time	$t_{D(OFF)}$		53	120		
Fall-Time	t_F		21	50		
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage (Note 2)	V_{SD}	$I_S=8.1\text{A}$, $V_{GS}=0\text{V}$, $T_J=25^\circ\text{C}$			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}	$di_F/dt=100\text{A}/\mu\text{s}$, $T_J=25^\circ\text{C}$, $I_F=8.1\text{A}$		190		ns
Reverse Recovery Charge (Note 2)	Q_{RR}			1.28		μC

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

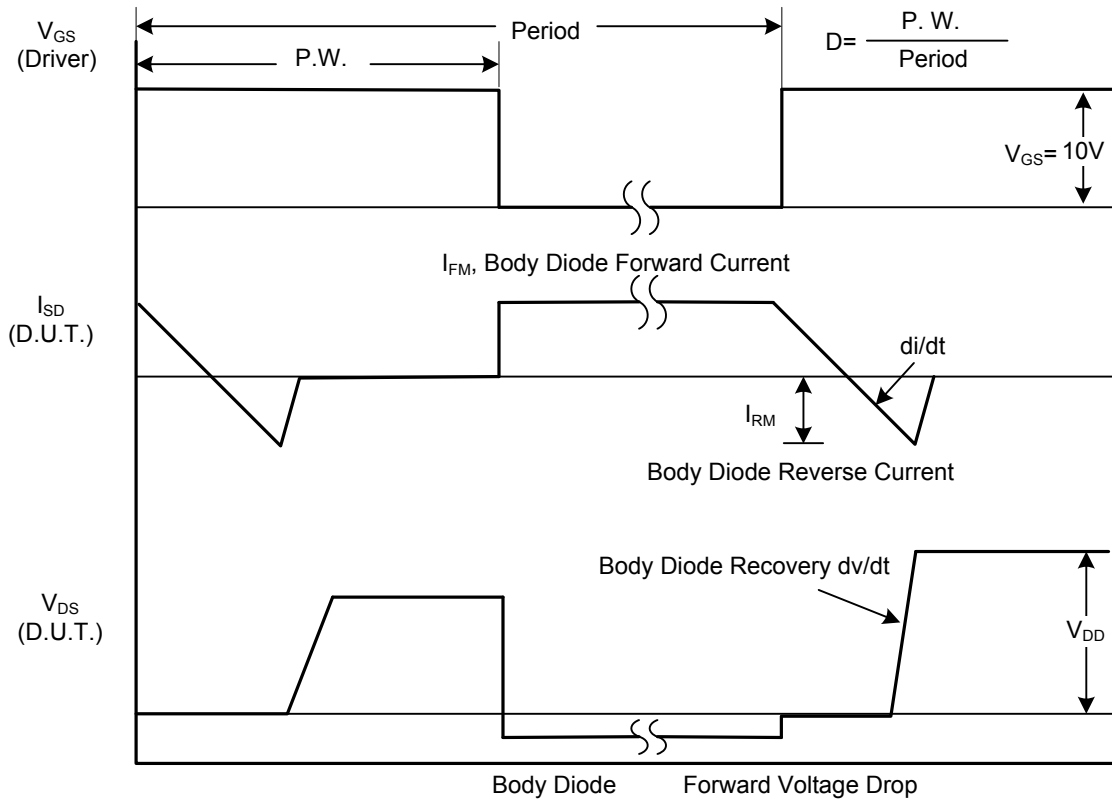
2. Pulse Test: Pulse Width = $250\mu\text{s}$, Duty Cycle $\leq 2\%$

3. Essentially Independent of Operating Temperature

■ TEST CIRCUITS AND WAVEFORMS

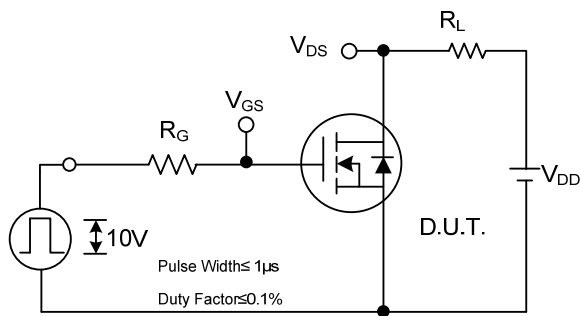


Peak Diode Recovery dv/dt Test Circuit

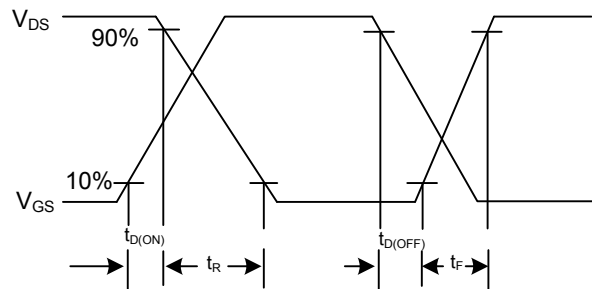


Peak Diode Recovery dv/dt Waveforms

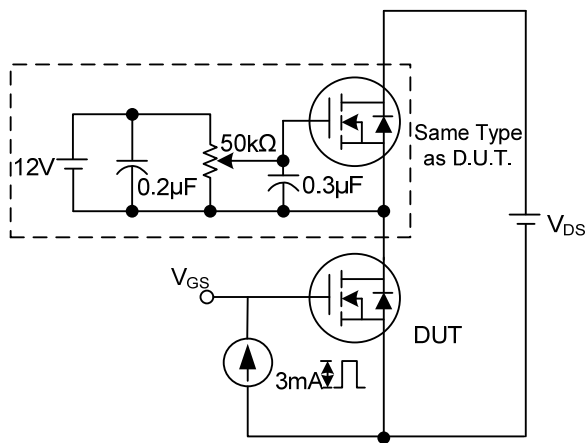
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



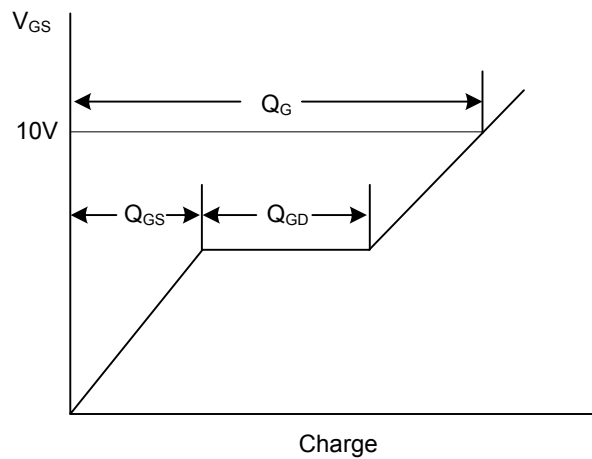
Switching Test Circuit



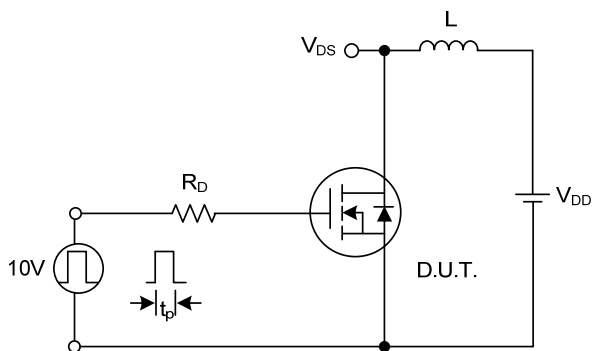
Switching Waveforms



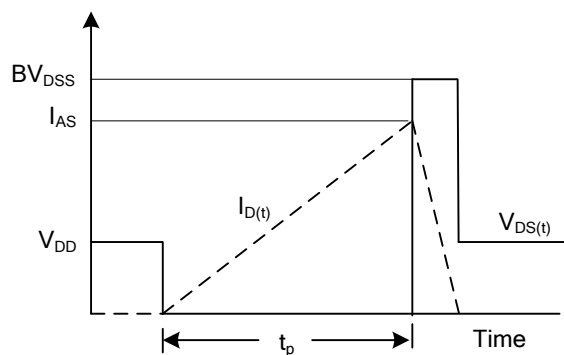
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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