

UF634-Q

Power MOSFET

8.1A, 250V N-CHANNEL POWER MOSFET

DESCRIPTION

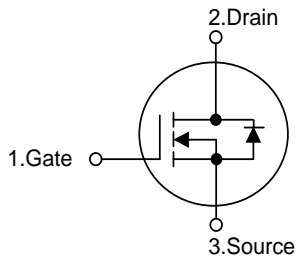
These kinds of N-channel power MOSFET field effect transistor have low conduction power loss, high input impedance, and high switching speed, Linear Transfer Characteristics, so can be use in a variety of power conversion applications.

The **UF634-Q** suitable for resonant and PWM converter topologies.

FEATURES

- * $R_{DS(ON)} \leq 0.55 \Omega @ V_{GS}=10V, I_D=4.0A$
- * Fast switching capability
- * Avalanche energy specified
- * Improved dv/dt capability, high ruggedness

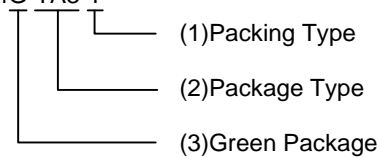
SYMBOL

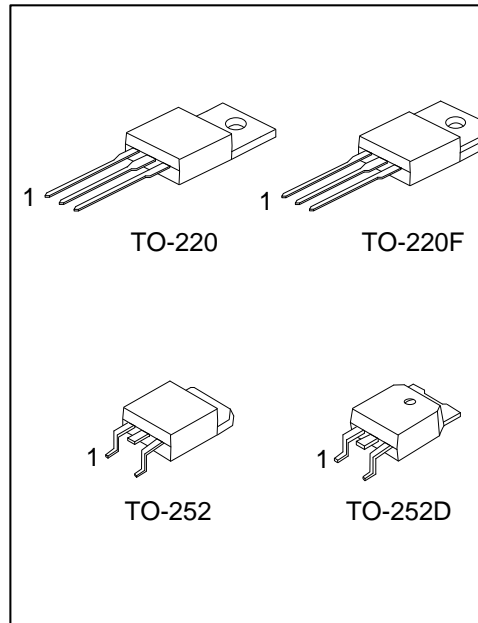


ORDERING INFORMATION

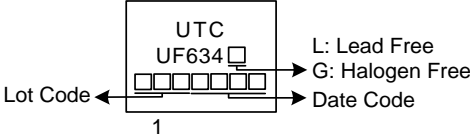
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen-Free		1	2	3	
UF634L-TA3-T	UF634G-TA3-T	TO-220	G	D	S	Tube
UF634L-TF3-T	UF634G-TF3-T	TO-220F	G	D	S	Tube
UF634L-TN3-R	UF634G-TN3-R	TO-252	G	D	S	Tape Reel
UF634L-TND-R	UF634G-TND-R	TO-252D	G	D	S	Tape Reel

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

<p>UF634G-TA3-T</p>  <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TA3: TO-220, TF3: TO-220F, TN3: TO-252</p> <p>TND: TO-252D</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	250	V
Gate-Source Voltage		V_{GSS}	± 30	V
Continuous Drain Current		I_D	8.1	A
Pulsed Drain Current (Note 2)		I_{DM}	32.4	A
Single Pulse Avalanche Energy Rating (Note 2)		E_{AS}	140	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	6.67	V/ns
Maximum Power Dissipation	TO-220	P_D	70	W
	TO-220F		38	W
	TO-252/TO-252D		50	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. $L=1.2\text{mH}$, $I_{AS}=11.8\text{A}$, $V_{DD}=50\text{V}$, $R_G=27\ \Omega$, Starting $T_J=25^\circ\text{C}$.

4. $I_{SD} \leq 8.1\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$.

■ **THERMAL RESISTANCES CHARACTERISTICS**

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
	TO-252/TO-252D		110	$^\circ\text{C}/\text{W}$
Junction to Case	TO-220	θ_{JC}	1.01	$^\circ\text{C}/\text{W}$
	TO-220F		3.29	$^\circ\text{C}/\text{W}$
	TO-252/TO-252D		2.5	$^\circ\text{C}/\text{W}$

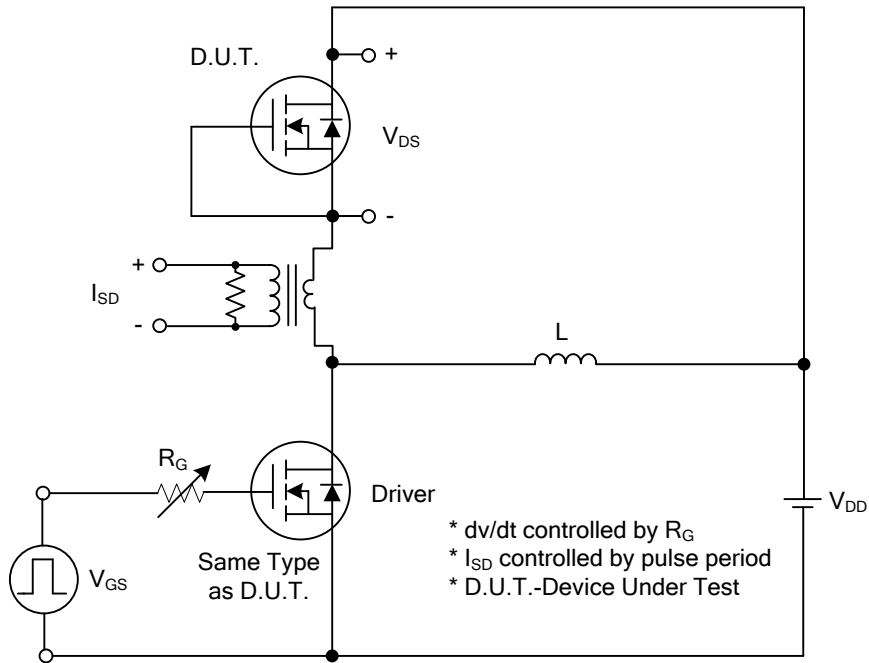
■ **ELECTRICAL CHARACTERISTICS** ($T_J = 25^\circ\text{C}$, unless otherwise specified)

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
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = 250\text{V}, V_{GS} = 0\text{V}$			10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS} = \pm 30\text{V}$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250\mu\text{A}$	2.0		4.0	V
Drain-Source On Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}, I_D=4.0\text{A}$			0.55	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS}=25\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$		450		pF
Output Capacitance	C_{OSS}			115		pF
Reverse Transfer Capacitance	C_{RSS}			41		pF
Gate Resistance	R_G	$V_{DS}=0\text{V}, f=1\text{MHz}$		1.5		Ω
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{DS}=150\text{V}, V_{GS}=10\text{V}, I_D=7.0\text{A}$ (Note 1, 2)		34		nC
Gate Source Charge	Q_{GS}			3		nC
Gate Drain Charge	Q_{GD}			9		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=30\text{V}, V_{GS}=10\text{V}, I_D=7.0\text{A},$ $R_G=25\Omega$ (Note 1, 2)		32		ns
Turn-ON Rise Time	t_R			60		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			160		ns
Turn-OFF Fall-Time	t_F			63		ns
SOURCE TO DRAIN DIODE SPECIFICATIONS						
Continuous Source Current (body diode)	I_S				8.1	A
Pulse Source Current (body diode) (Note)	I_{SM}				32.4	A
Diode Forward Voltage (Note)	V_{SD}	$I_S=8.1\text{A}, V_{GS}=0\text{V}$			1.4	V
Reverse Recovery Time	t_{rr}	$I_S=8.1\text{A}, dI_S/dt=100\text{A}/\mu\text{s}$		120		ns
Reverse Recovery Charge	Q_{rr}			0.3		μC

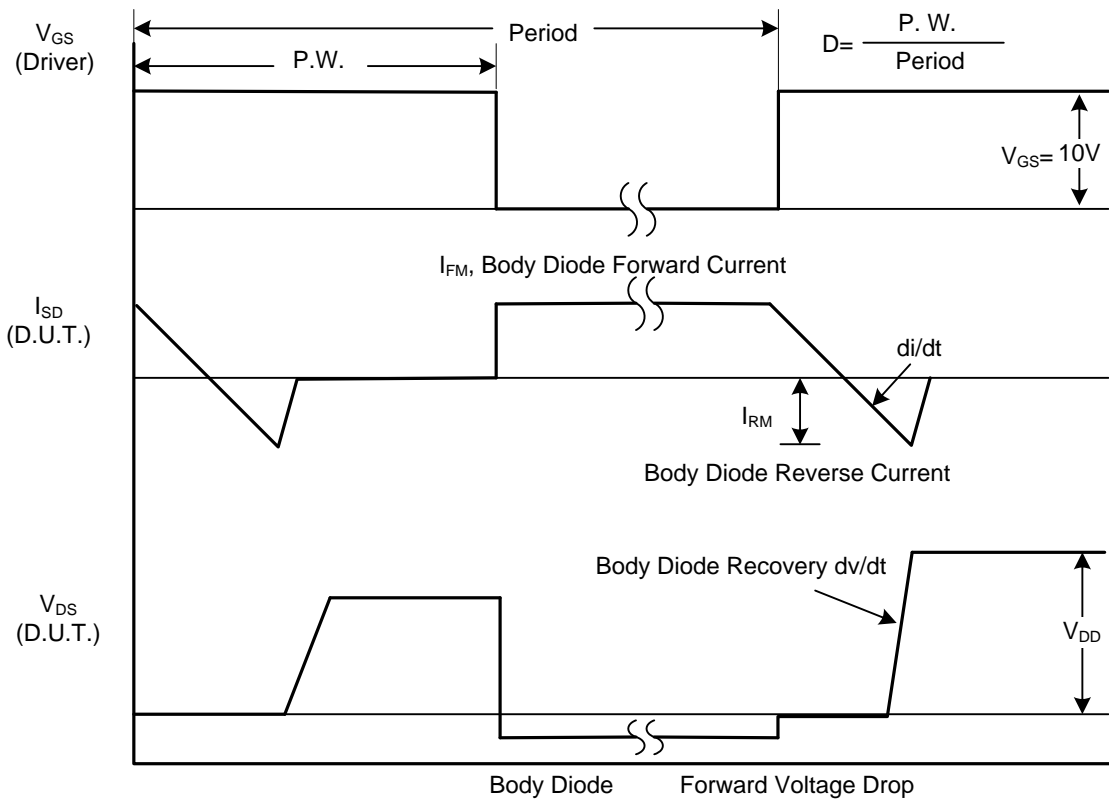
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

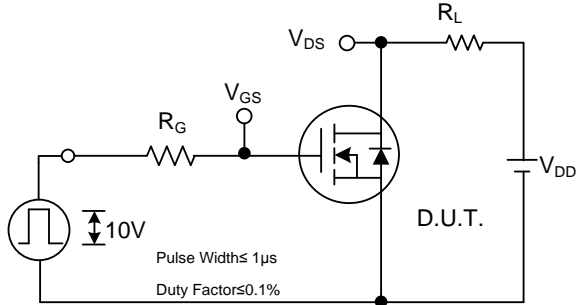


Peak Diode Recovery dv/dt Test Circuit

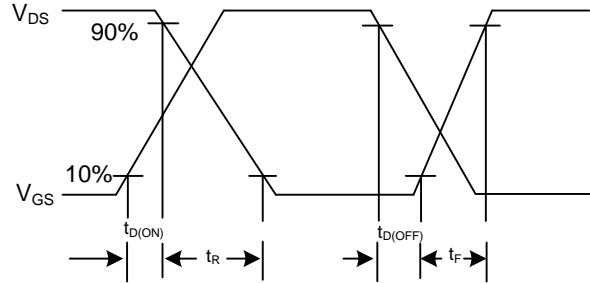


Peak Diode Recovery dv/dt Waveforms

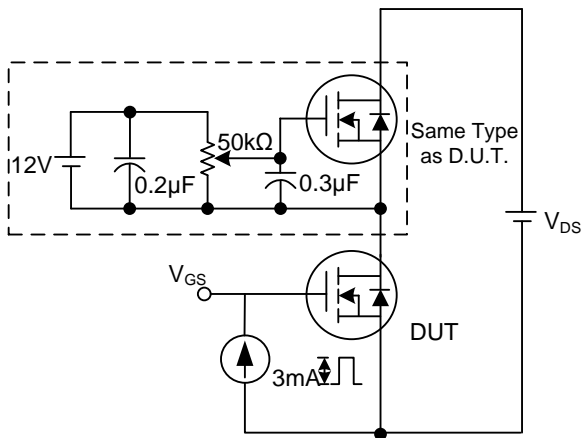
TEST CIRCUITS AND WAVEFORMS



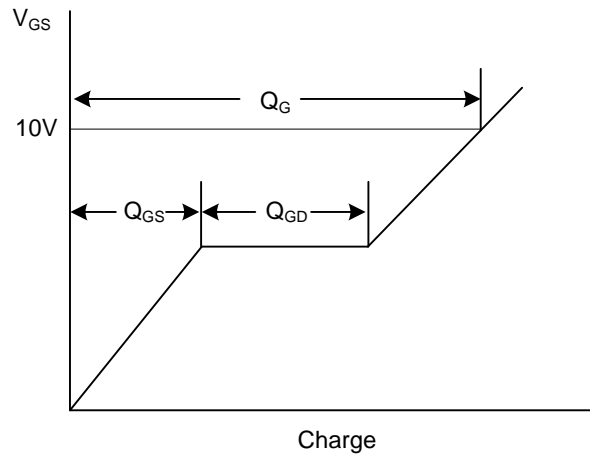
Switching Test Circuit



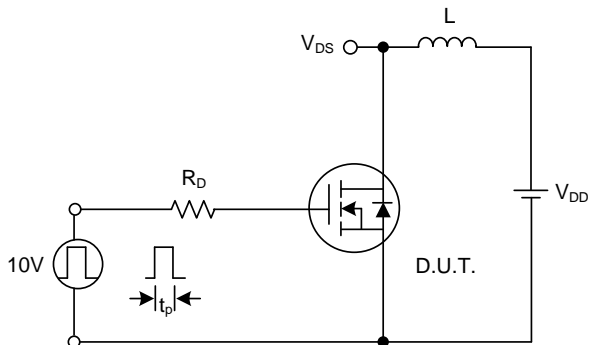
Switching Waveforms



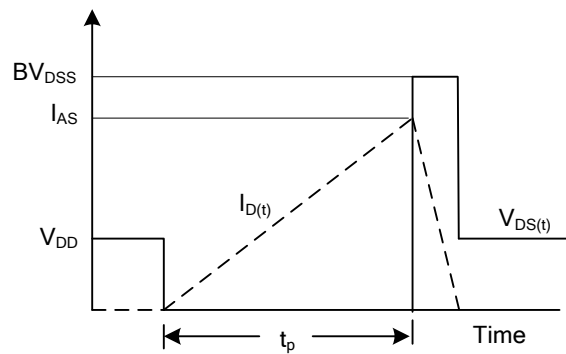
Gate Charge Test Circuit



Gate Charge Waveform

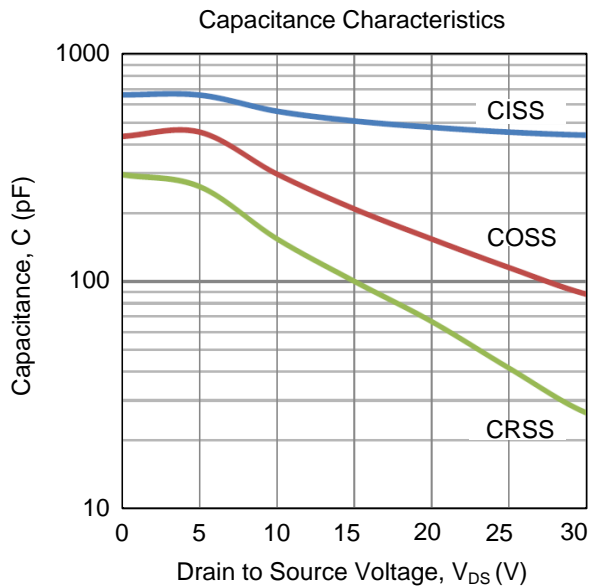


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ **TYPICAL CHARACTERISTICS**



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