



P CHANNEL POWER MOSFET

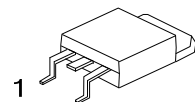
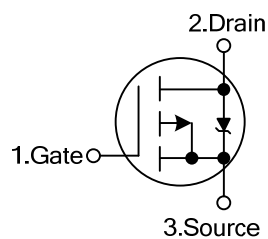
DESCRIPTION

The UTC **UFR9120** is a P-channel power MOSFET using UTC's advanced processing technology to provide customers a minimum on-state resistance and high switching speed

FEATURES

- * Fully Avalanche Rated
- * High Switching Speed
- * extremely Low On-Resistance
- * Surface Mount

SYMBOL



TO-252

ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UFR9120L-TN3-R	UFR9120G-TN3-R	TO-252	G	D	S	Tape Reel
UFR9120L-TN3-T	UFR9120G-TN3-T	TO-252	G	D	S	Tube

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

UFR9120L-TN3-R	(1)Packing Type	(1) R: Tape Reel, T: Tube
	(2)Package Type	(2) TN3: TO-252
	(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
Drain-Source Voltage			V _{DSS}	-100	V
Gate-Source Voltage			V _{GSS}	±20	V
Drain Current, V _{GS} @-10V	Continuous	T _C =25°C	I _D	-6.6	A
		T _C =100°C		-4.2	A
	Pulsed (Note 2)		I _{DM}	-26	A
Avalanche Current (Note 2)			I _{AR}	-6.6	A
Avalanche Energy	Single Pulsed (Note 3)		E _{AS}	100	mJ
	Repetitive (Note 2)		E _{AR}	4.0	mJ
Peak Diode Recovery dv/dt (Note 4)			dv/dt	-5.0	V/ns
Power Dissipation T _C =25°C			P _D	40	W
Linear Derating Factor				0.32	W/°C
Junction Temperature			T _J	+150	°C
Storage Temperature			T _{STG}	-55~+150	°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 max. junction temperature.(See Fig.11)

3. Starting $T_J=25^\circ\text{C}$, $L=13\text{mH}$, $R_G=25\Omega$, $I_{AS}=-3.9\text{A}$ (See Fig.12)

4. $I_{SD} \leq -4.0\text{A}$, $di/dt \leq 300\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 25^\circ\text{C}$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	110	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	3.1	$^\circ\text{C}/\text{W}$

Note: 1. For recommended footprint and soldering techniques refer to application note

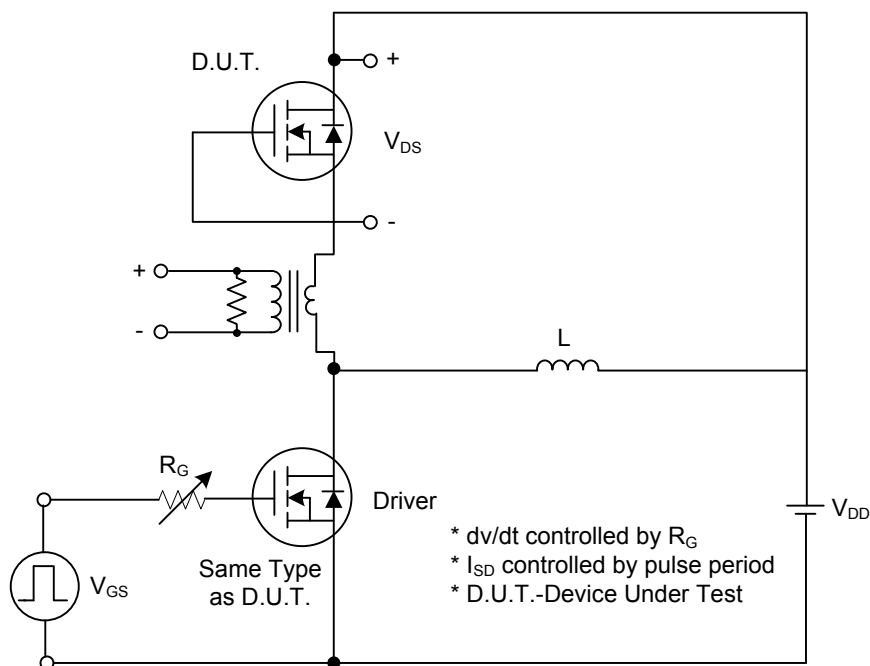
■ ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	-100			V
Breakdown Voltage Temperature Coefficient		$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C, $I_D=-1mA$		-0.11		V/°C
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=-100V, V_{GS}=0V$			-25	μA
			$V_{DS}=-80V, V_{GS}=0V, T_J=150^\circ C$			-250	
Gate- Source Leakage Current	Forward	I_{GSS}	$V_{GS}=+20V$			+100	nA
	Reverse		$V_{GS}=-20V$			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-2.0		-4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-3.9A$			0.48	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	$V_{GS}=0V, V_{DS}=-25V, f=1.0MHz$		350		pF
Output Capacitance		C_{OSS}			110		pF
Reverse Transfer Capacitance		C_{RSS}			70		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	$V_{GS}=-10V, V_{DS}=-80V, I_D=-4.0A$ (Note 1, 2)			27	nC
Gate to Source Charge		Q_{GS}				5.0	nC
Gate to Drain Charge		Q_{GD}				15	nC
Turn-ON Delay Time		$t_{D(ON)}$	$V_{DD}=-50V, I_D=-4.0A, R_G=12\Omega, R_D=12\Omega$ (Note 1, 2)		14		ns
Rise Time		t_R			47		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			28		ns
Fall-Time		t_F			31		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S	MOSFET symbol showing the integral reverse p-n junction diode			-6.6	A
Maximum Body-Diode Pulsed Current (Note 1)		I_{SM}				-26	A
Drain-Source Diode Forward Voltage		V_{SD}	$I_S=-3.9A, V_{GS}=0V, T_J=25^\circ C$			-2.0	V
Body Diode Reverse Recovery Time		t_{RR}	$I_F=-4.0A, V_{GS}=0V, di/dt=100A/\mu s,$		100	150	ns
Body Diode Reverse Recovery Charge		Q_{RR}	$T_J=25^\circ C$ (Note 1)		420	630	nC

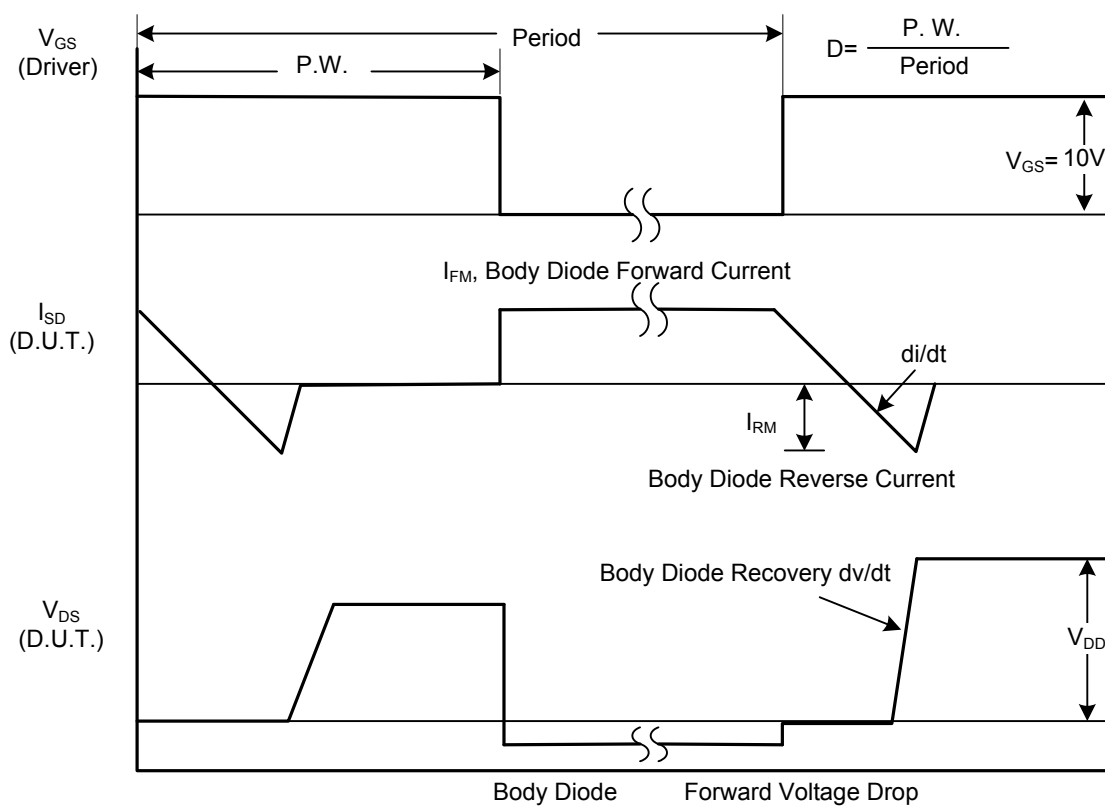
Notes: 1. Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

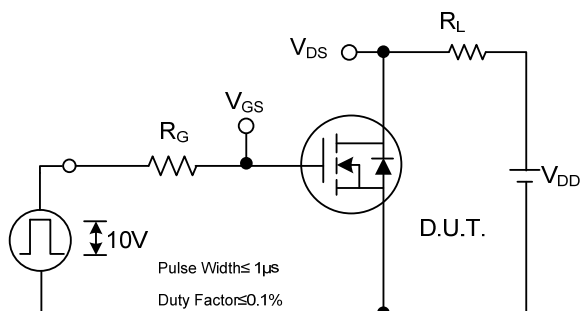


Peak Diode Recovery dv/dt Test Circuit

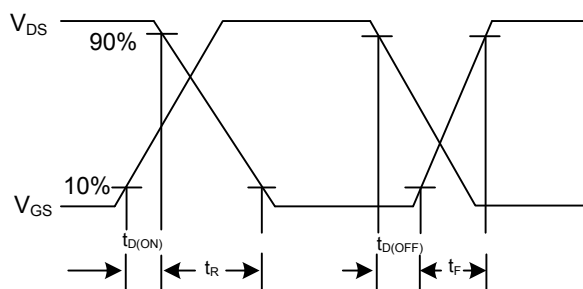


Peak Diode Recovery dv/dt Waveforms

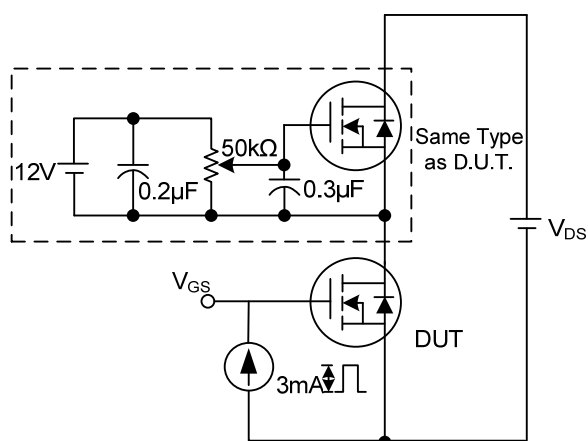
■ TEST CIRCUITS AND WAVEFORMS(Cont.)



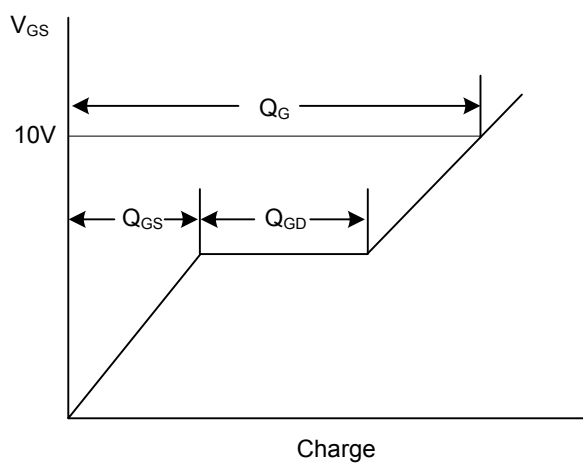
Switching Test Circuit



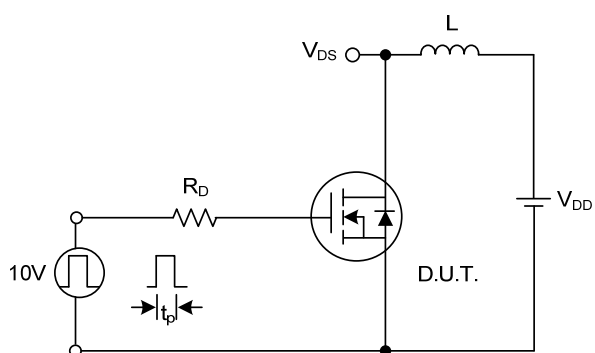
Switching Waveforms



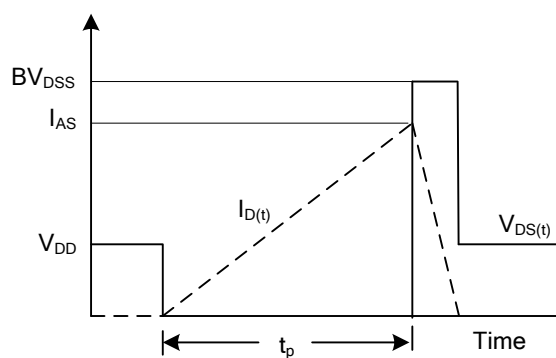
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.

