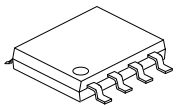
UF7493

Power MOSFET

80A, 80V N-CHANNEL POWER MOSFET



SOP-8

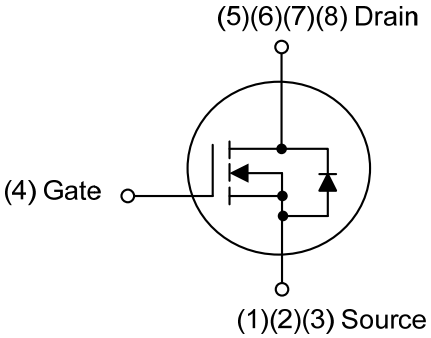
■ DESCRIPTION

The UTC **UF7493** is a N-channel MOSFET using UTC advanced technology. It can be used in applications, such as power supply (secondary synchronous rectification), industrial and primary switch etc.

■ FEATURES

* $R_{DS(ON)} \leq 14\ m\Omega$ @ V_{GS}=10V, I_D=80A
* Trench FET Power MOSFETS Technology

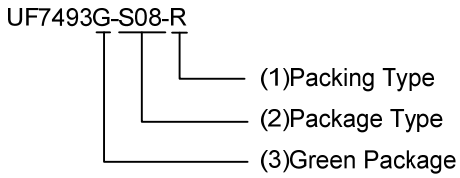
■ SYMBOL



■ ORDERING INFORMATION

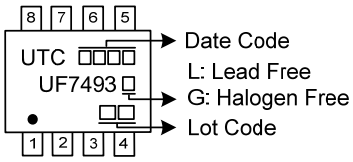
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UF7493L-S08-R	UF7493G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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



(1) R: Tape Reel
(2) S08: SOP-8
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_J=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	80	V
Gate Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	80	A
Pulsed Drain Current	I_{DM}	160	A
Avalanche Energy, Single Pulse	E_{AS}	142	mJ
Peak Diode Recovery dv/dt (Note 4)	dv/dt	4.3	V/ns
Power Dissipation	P_D	7.5	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. L=0.1mH, I_{AS}=54A, V_{DD}=25V, R_G=20Ω, Starting T_J =25°C.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	125 (Note)	°C/W
Junction to Case	θ_{JC}	16.67 (Note)	°C/W

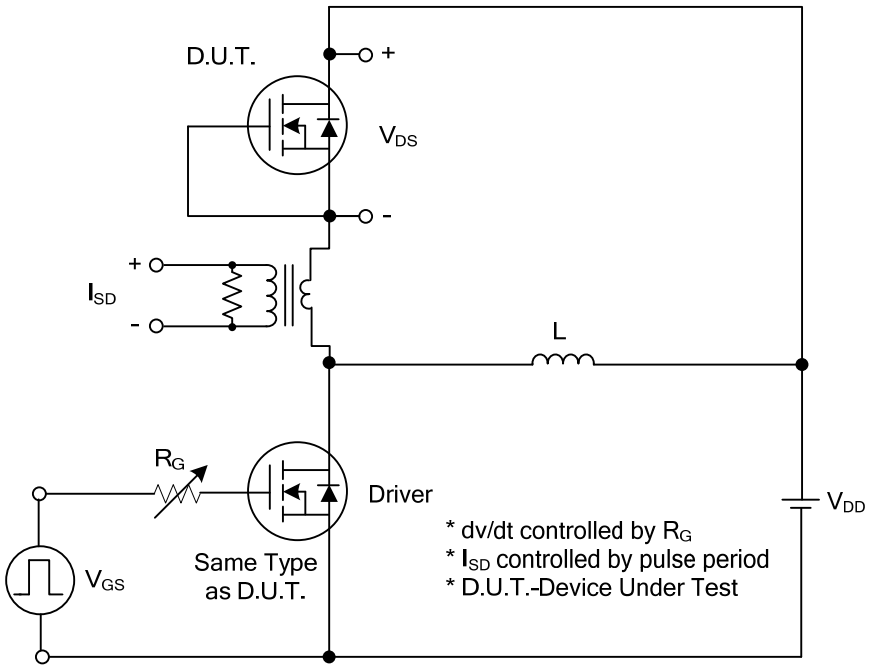
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

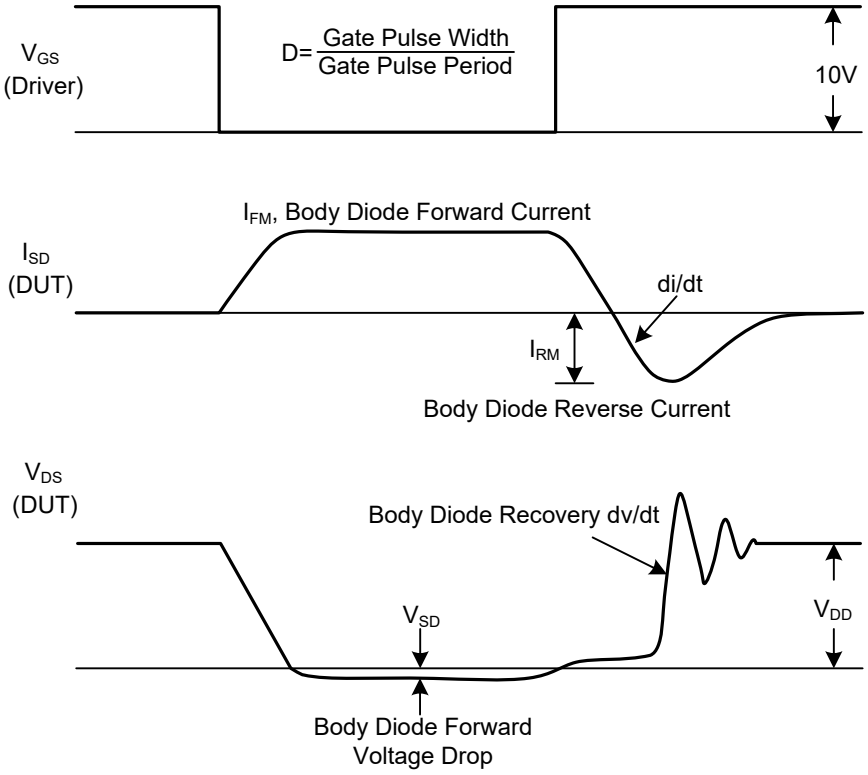
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	80			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=80V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=80A			14	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		4000		pF
Output Capacitance	C_{OSS}			330		pF
Reverse Transfer Capacitance	C_{RSS}			270		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DD}=64V, V_{GS}=0~10V, I_D=80A		110		nC
Gate to Source Charge	Q_{GS}			22		nC
Gate to Drain Charge	Q_{GD}			33		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{DD}=40V, V_{GS}=10V, I_D=80A, R_G=3.3Ω		18		ns
Rise Time	t_R			20		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			58		ns
Fall-Time	t_F			24		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				80	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				160	A
Drain-Source Diode Forward Voltage	V_{SD}	I_S=80A, V_{GS}=0V		0.9	1.3	V
Reverse Recovery Time (Note 1)	t_{rr}	I_S=30A, V_{GS}=0V, dI_F/dt=100A/μs (Note1)		60		ns
Reverse Recovery Charge	Q_{rr}			220		nC

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

■ TEST CIRCUITS AND WAVEFORMS

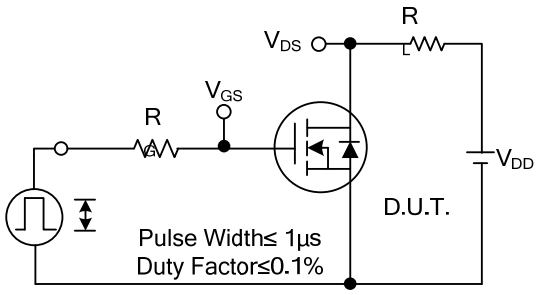


Peak Diode Recovery dv/dt Test Circuit

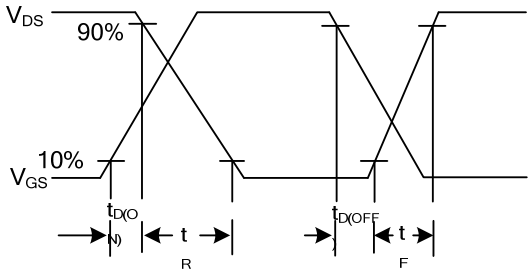


Peak Diode Recovery dv/dt Waveforms

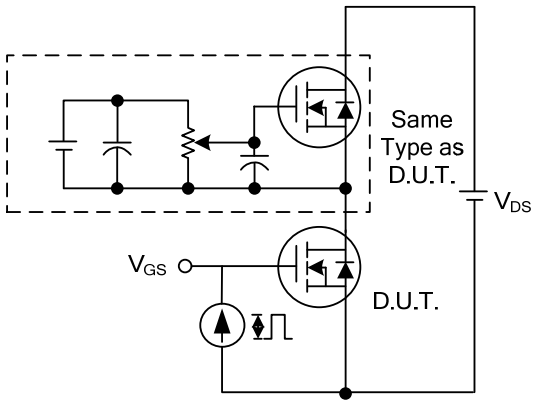
■ TEST CIRCUITS AND WAVEFORMS



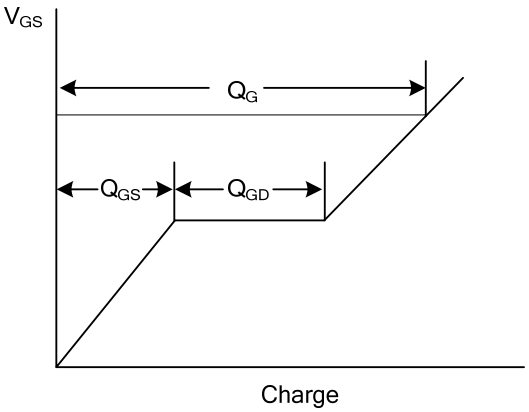
Switching Test Circuit



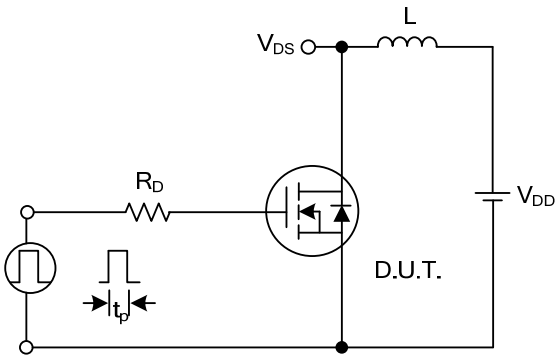
Switching Waveforms



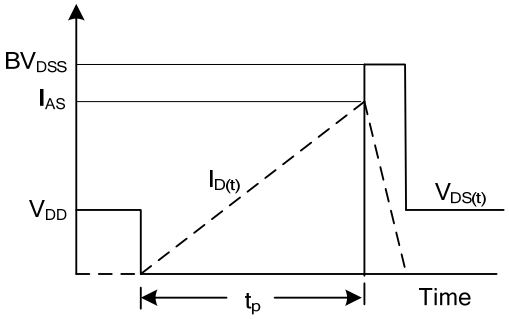
Gate Charge Test Circuit



Gate Charge Waveform

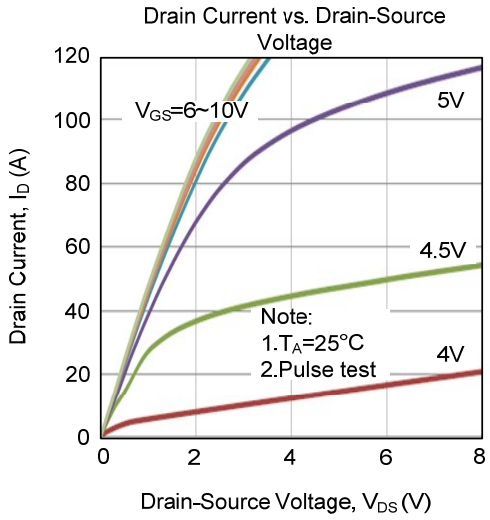


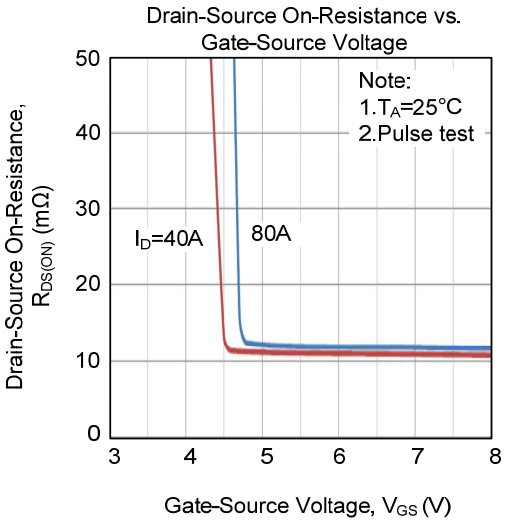
Unclamped Inductive Switching Test Circuit

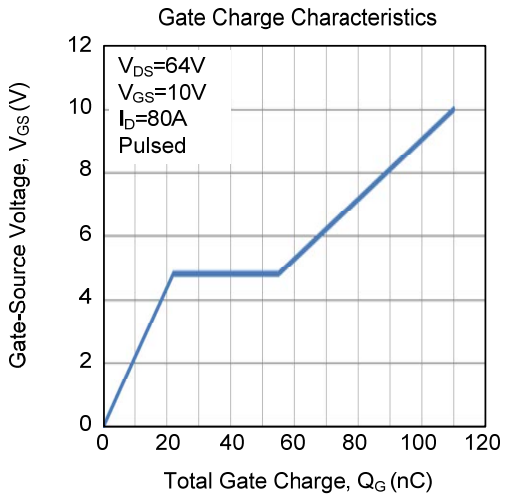


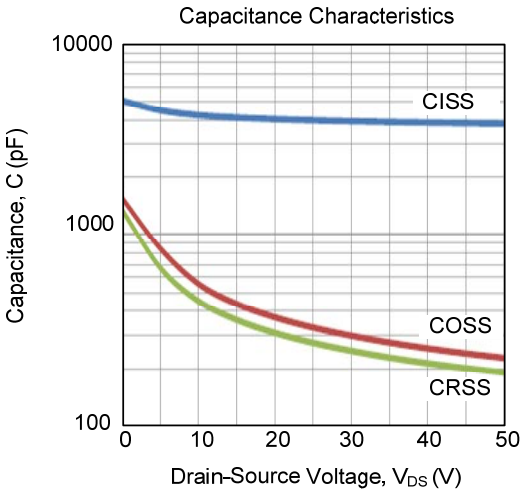
Unclamped Inductive Switching Waveforms

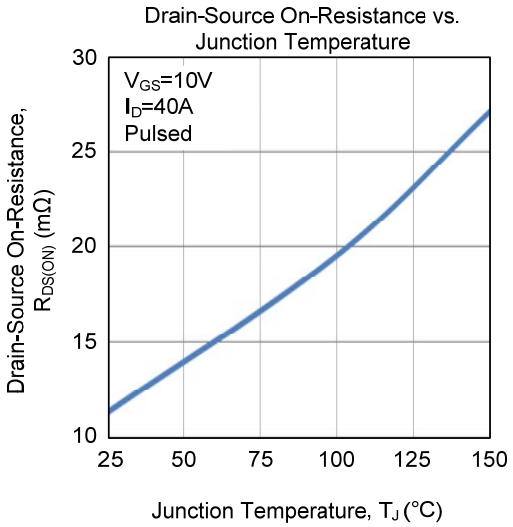
■ TYPICAL CHARACTERISTICS

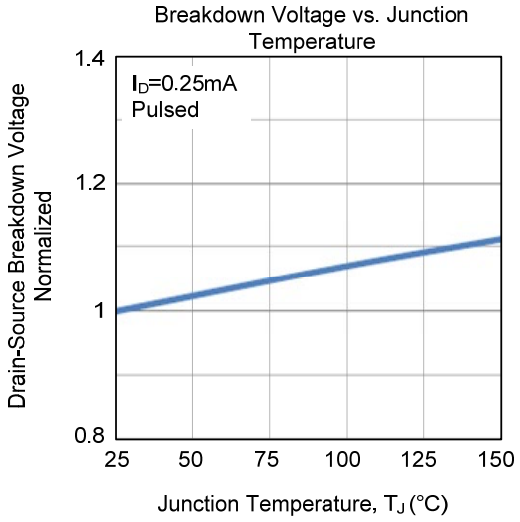






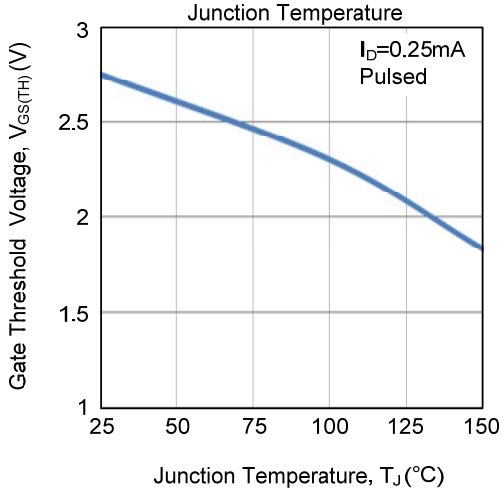




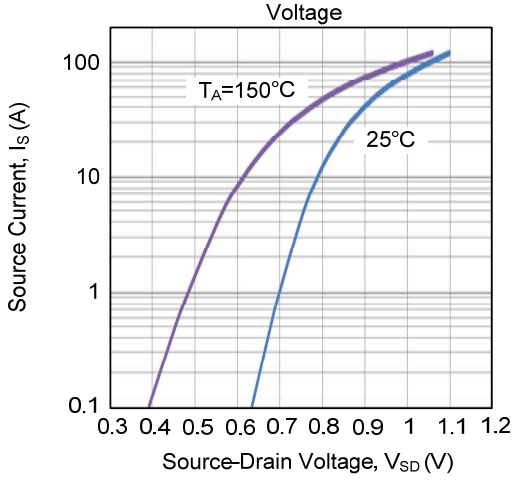


■ TYPICAL CHARACTERISTICS (Cont.)

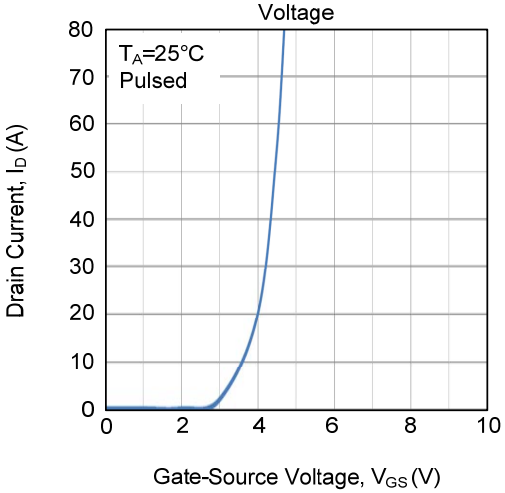
Gate Threshold Voltage vs. Junction Temperature



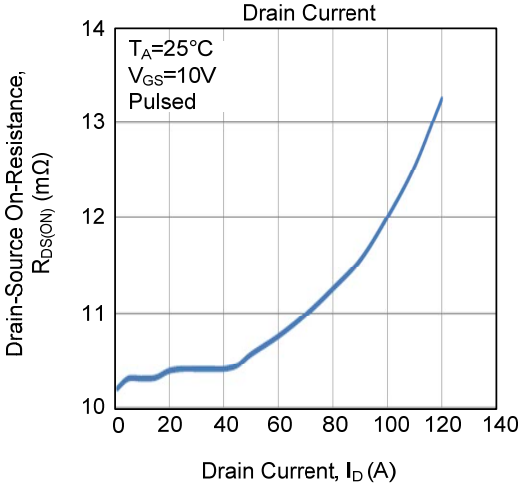
Source Current vs. Source-Drain Voltage



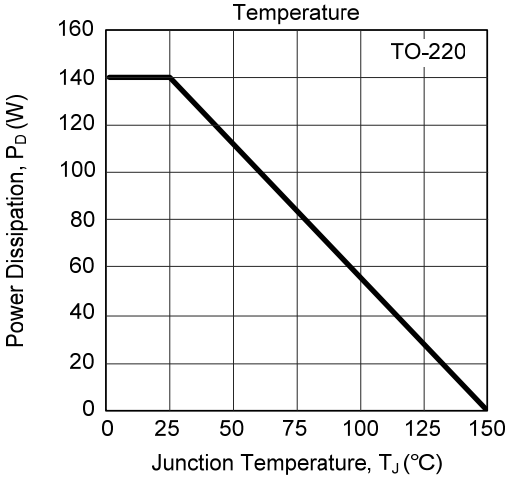
Drain Current vs. Gate-Source Voltage



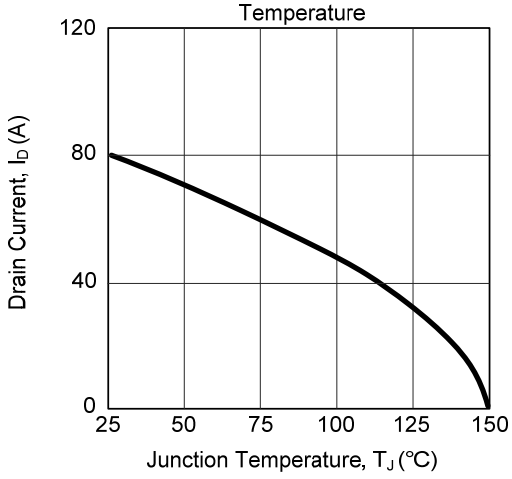
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)