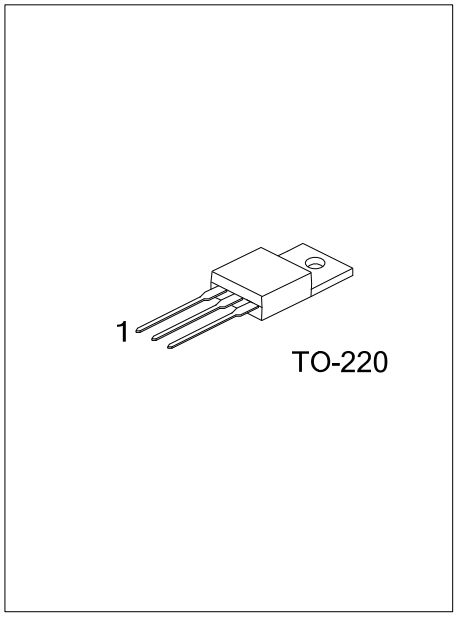
UF3205-Q

Power MOSFET

110A, 55V N-CHANNEL POWER MOSFET



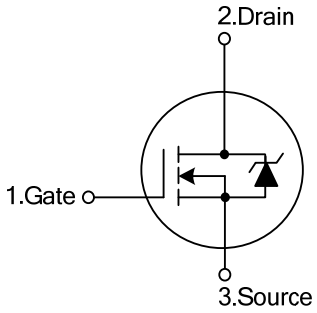
■ DESCRIPTION

The UTC **UF3205-Q** uses advanced technology to provide excellent $R_{DS(ON)}$, fast switching, low gate charge, and extremely efficient. This device is suitable for all commercial-industrial applications at power dissipation levels to approximately 50 watts.

■ FEATURES

* $R_{DS(ON)}$ < 10 mΩ @ V_{GS}=10V, I_D=62A
* Ultra Low Gate Charge (250nC max)
* Low Reverse Transfer Capacitance (C_{RSS} = typ. 128 pF)
* Fast Switching Capability
* Avalanche Energy Specified
* Improved dv/dt Capability, High Ruggedness

■ SYMBOL



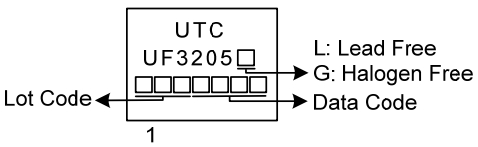
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UF3205L-TA3-T	UF3205G-TA3-T	TO-220	G	D	S	Tube

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

UF3205G-TA3-T (1)Packing Type (2)Package Type (3)Green Package	(1) T: Tube (2) TA3: TO-220 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Gate-Source Voltage		V_{GSS}	±20	V
Drain-Source Voltage		V_{DSS}	55	V
Drain Current	Continuous (V_{GS}=10V)	I_D	110	A
	Pulsed (Note 2)	I_{DM}	440	
Avalanche Current (Note 2)		I_{AR}	62	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	1150	mJ
Power Dissipation (T_C=25°C)		P_D	200	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. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. L=0.6mH, I_{AS}=62A, V_{DD}=-50V, R_G=25Ω, Starting T_J=25°C
4. I_{SD}≤62A, di/dt ≤ 200μA/ s, V_{DD}≤BV_{DSS}, Starting T_J=25°C

■ THERMAL DATA

PARAMETER	SYMBOL	MAX	UNIT
Junction to Ambient	θ_{JA}	62.5	°C/W
Junction to Case	θ_{JC}	0.63	°C/W

■ 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}	V_{GS}=0V, I_D=250μA	55			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=55V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±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-Resistance (Note)	$R_{DS(ON)}$	V_{GS}=10V, I_D=62A			10	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=25V, V_{GS}=0V, f=1MHz		2762		pF
Output Capacitance	C_{OSS}			685		pF
Reverse Transfer Capacitance	C_{RSS}			128		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DS}=50V, I_D=1.3A, V_{GS}=10V		250		nC
Gate Source Charge	Q_{GS}			12		nC
Gate Drain Charge	Q_{GD}			27		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{DD}=30V, I_D=0.5A, R_G=25Ω, V_{GS}=10V (Note)		70		ns
Turn-ON Rise Time	t_R			142		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			1100		ns
Turn-OFF Fall-Time	t_F			450		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				110	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				440	A
Diode Forward Voltage	V_{SD}	I_S=62A ,V_{GS}=0V			1.3	V
Body Diode Reverse Recovery Time	t_{rr}	I_F=30A, di/dt=100A/μs (Note)		50		ns
Body Diode Reverse Recovery Charge	Q_{rr}			70		nC

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

■ TEST CIRCUITS AND WAVEFORMS

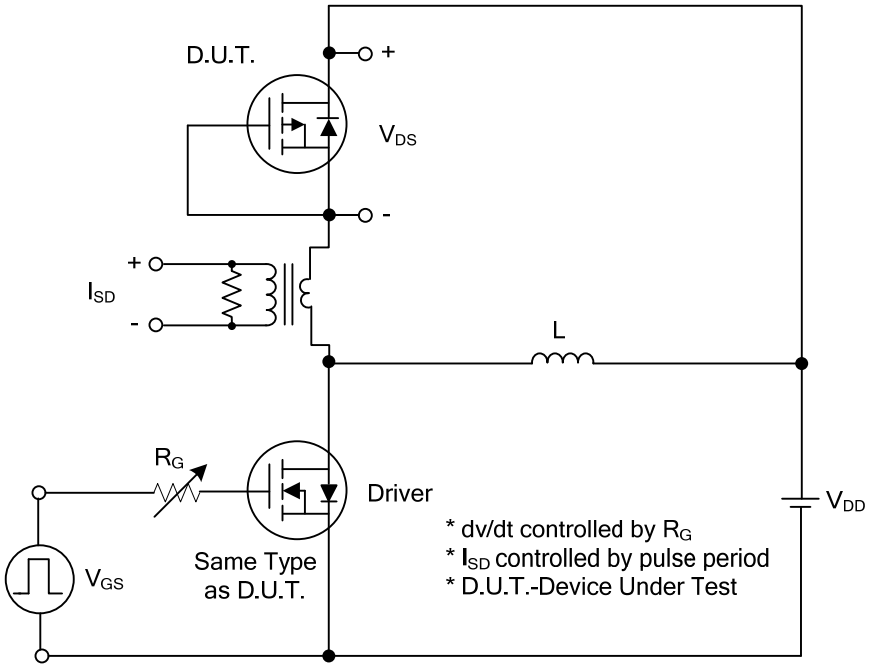


Fig. 1A Peak Diode Recovery dv/dt Test Circuit

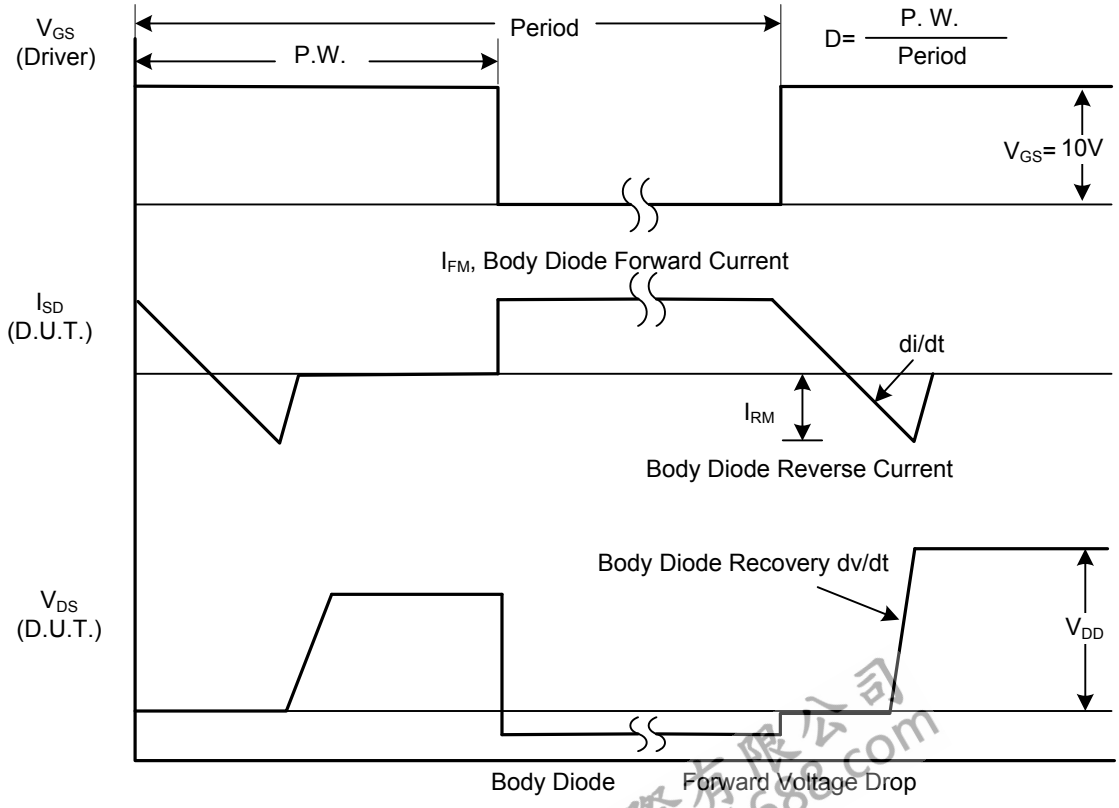
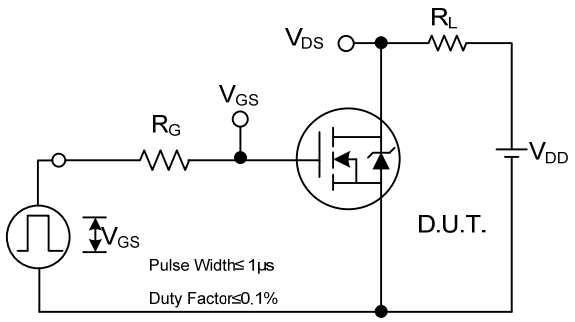
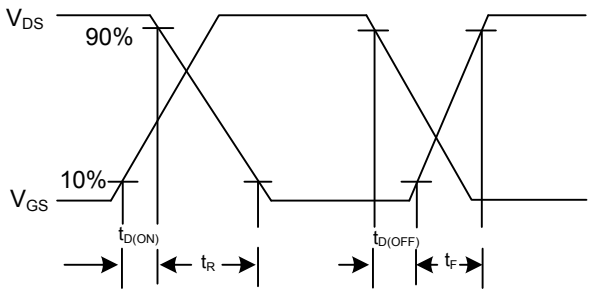


Fig. 1B Peak Diode Recovery dv/dt Waveforms

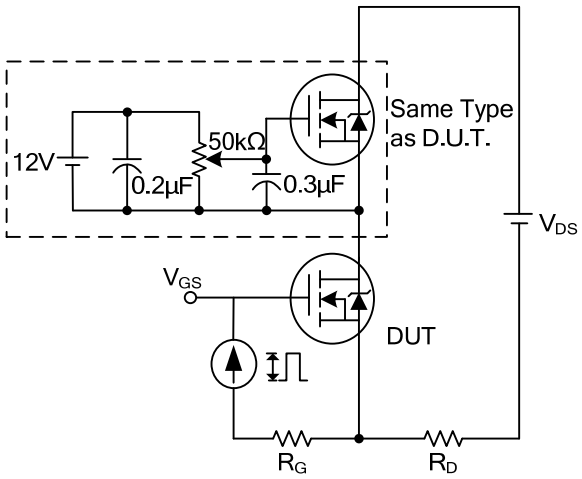
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



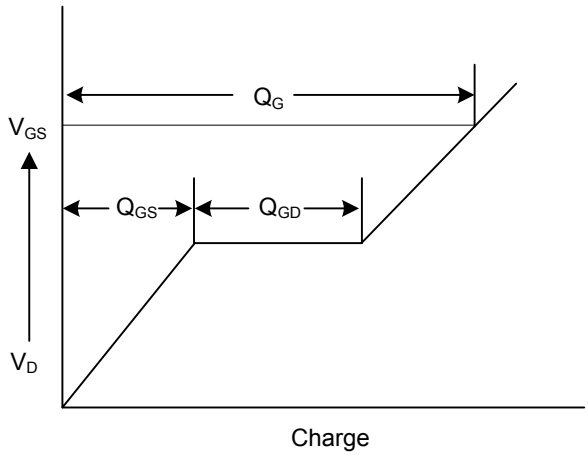
2A Switching Test Circuit



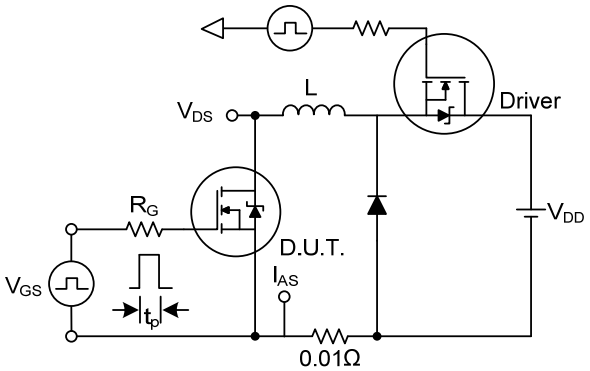
2B Switching Waveforms



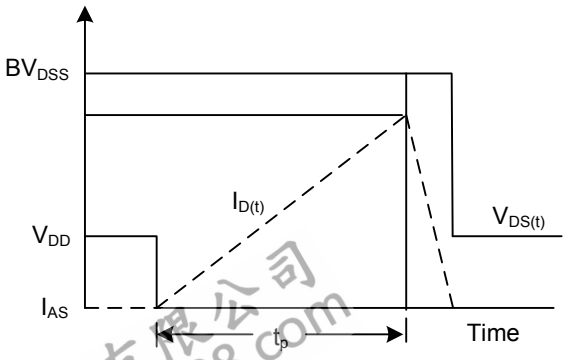
3A Gate Charge Test Circuit



3B Gate Charge Waveform



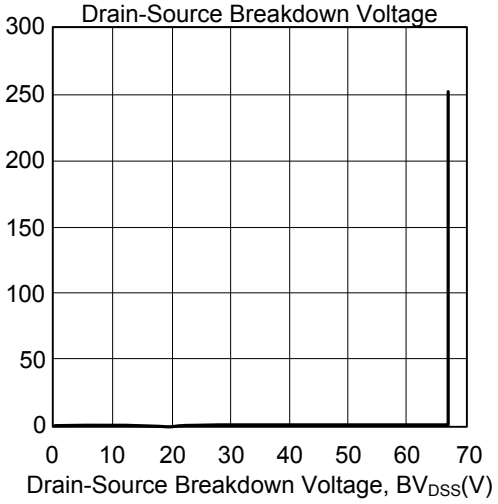
4A Unclamped Inductive Switching Test Circuit



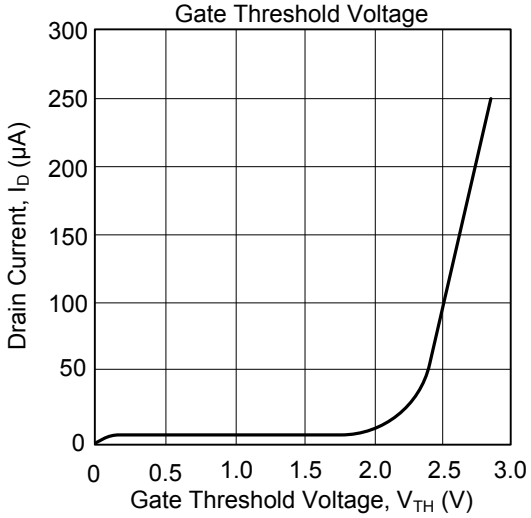
4B Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

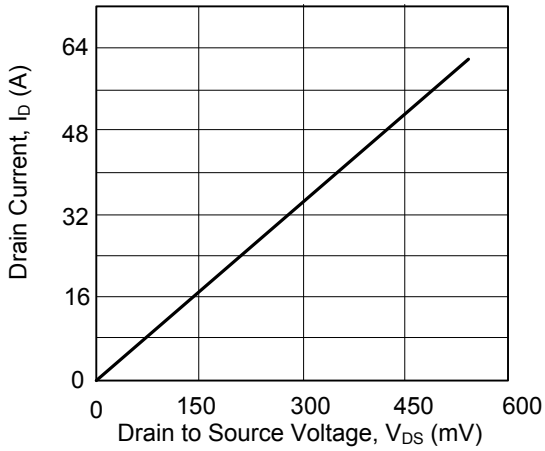
Drain Current vs.
Drain-Source Breakdown Voltage



Drain Current vs.
Gate Threshold Voltage



Drain-Source On-State Resistance
Characteristics



Drain Current vs.
Source to Drain Voltage