



N-CHANNEL ENHANCEMENT MODE POWER MOSFET

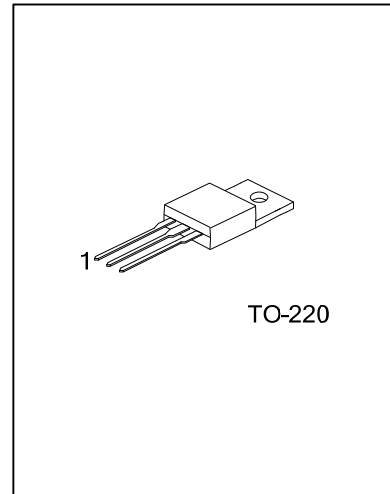
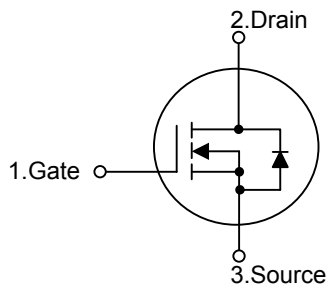
DESCRIPTION

The UTC **UTT3205** uses advanced technology to provide excellent $R_{DS(ON)}$, fast switching, low gate charge, and excellent efficiency. This device is suitable for all commercial-industrial applications at power dissipation levels to approximately 50 watts.

FEATURES

- * $R_{DS(ON)} < 20m\Omega$ @ $V_{GS} = 10V$
- * Ultra Low Gate Charge (146nC max)
- * Low Reverse Transfer Capacitance ($C_{RSS} = \text{typ. } 211 \text{ pF}$)
- * 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	
UTT3205L-TA3-T	UTT3205G-TA3-T	TO-220	G	D	S	Tube

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

UTT3205L-TA3-T 	(1) Packing Type (2) Package Type (3) Lead Free	(1) T: Tube (2) TA3: TO-220 (3) G: Halogen Free, L: Lead Free
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■ ABSOLUTE MAXIMUM RATINGS ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current	Continuous ($V_{GS}=10\text{V}$)	I_D	110	A
	Pulsed (Note 2)	I_{DM}	390	
Avalanche Current (Note 2)		I_{AR}	62	A
Avalanche Energy	Repetitive (Note 2)	E_{AR}	20	mJ
	Single Pulsed (Note 3)	E_{AS}	450	
Power Dissipation ($T_C=25^{\circ}\text{C}$)		P_D	200	W
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. Pulse width limited by $T_{J(MAX)}$

3. $T_J=25^{\circ}\text{C}$, $L=138\mu\text{H}$, $R_G=25\Omega$, $I_{AS}=62\text{A}$

■ THERMAL DATA

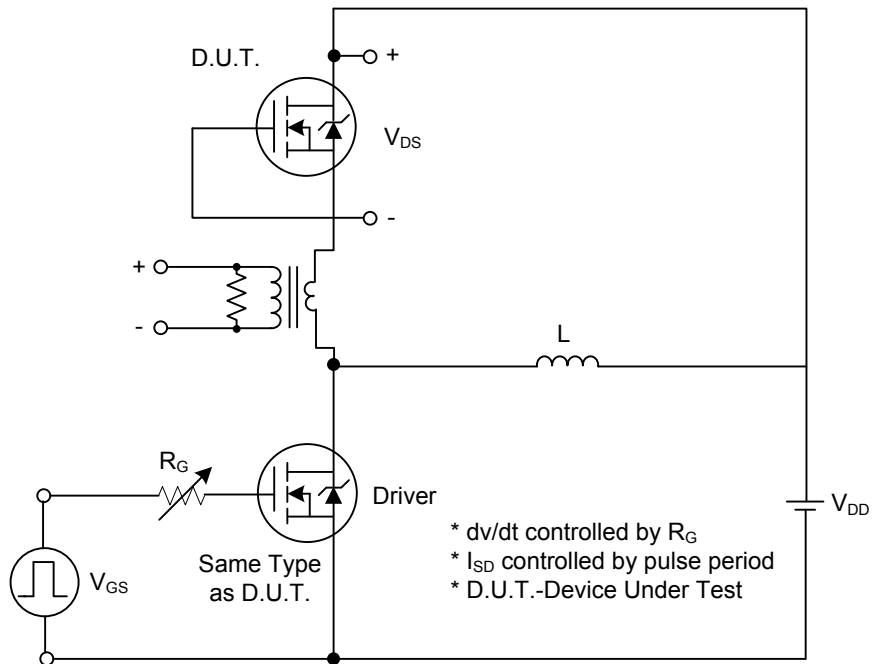
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62	$^{\circ}\text{C}/\text{W}$
Junction to Case	θ_{JC}	0.75	$^{\circ}\text{C}/\text{W}$

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

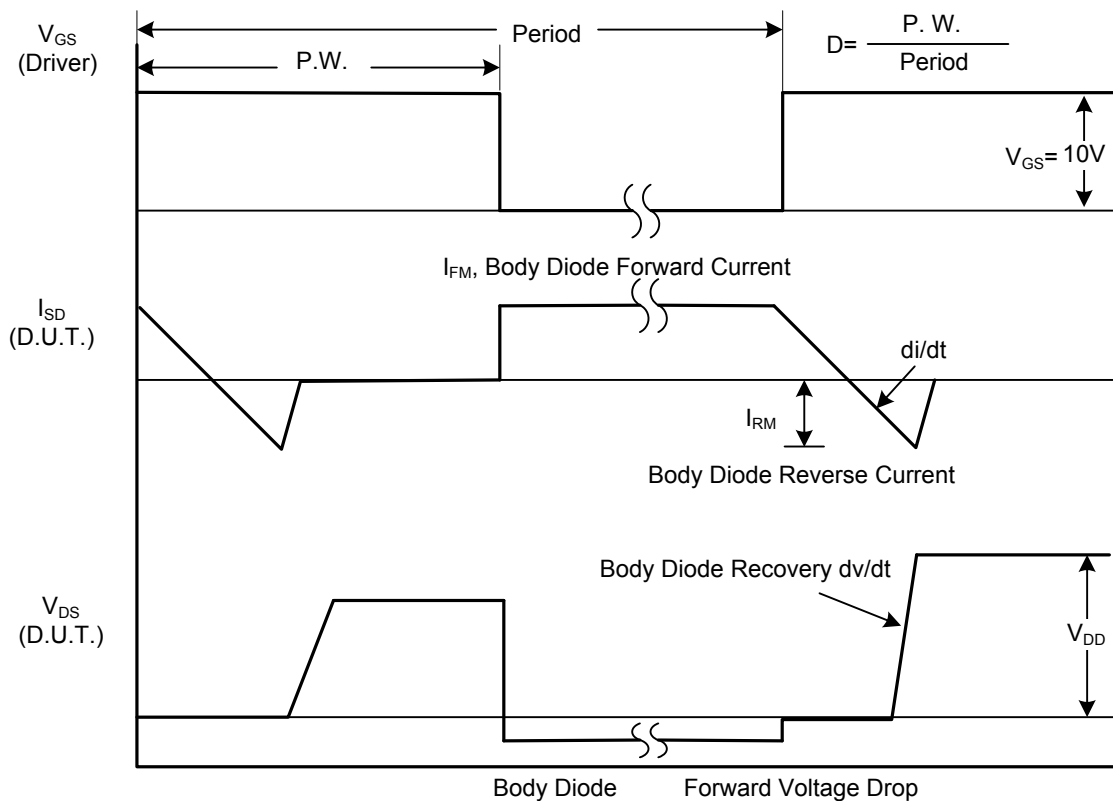
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0\text{V}$, $I_D=250\mu\text{A}$	55			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=55\text{V}$, $V_{GS}=0\text{V}$			25	μA
Gate- Source Leakage Current	I_{GSS}	Forward $V_{GS}=+20\text{V}$, $V_{DS}=0\text{V}$			+100	nA
		Reverse $V_{GS}=-20\text{V}$, $V_{DS}=0\text{V}$			-100	nA
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C , $I_D=1\text{mA}$		0.057		$\text{V}/^{\circ}\text{C}$
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	1.4		3.0	V
Static Drain-Source On-Resistance (Note)	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=62\text{A}$			20	m Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS}=25\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$		3247		pF
Output Capacitance	C_{OSS}			781		pF
Reverse Transfer Capacitance	C_{RSS}			211		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{DS}=44\text{V}$, $I_D=62\text{A}$, $V_{GS}=10\text{V}$			146	nC
Gate Source Charge	Q_{GS}				35	nC
Gate Drain Charge	Q_{GD}				54	nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=28\text{V}$, $I_D=62\text{A}$, $R_G=4.5\Omega$, $V_{GS}=10\text{V}$ (Note)		14		ns
Turn-ON Rise Time	t_R			101		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			50		ns
Turn-OFF Fall-Time	t_F			65		ns
Internal Drain Inductance	L_D			4.5		nH
Internal Source Inductance	L_S		7.5		nH	
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Diode Forward Voltage	V_{SD}	$I_S=62\text{A}$, $V_{GS}=0\text{V}$			1.3	V
Maximum Continuous Drain-Source Diode Forward Current	I_S				110	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				390	A

Note: Pulse width $\leq 400\mu\text{s}$; duty cycle $\leq 2\%$.

■ TEST CIRCUITS AND WAVEFORMS

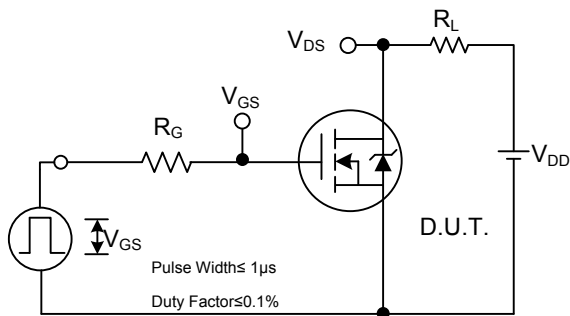


Peak Diode Recovery dv/dt Test Circuit

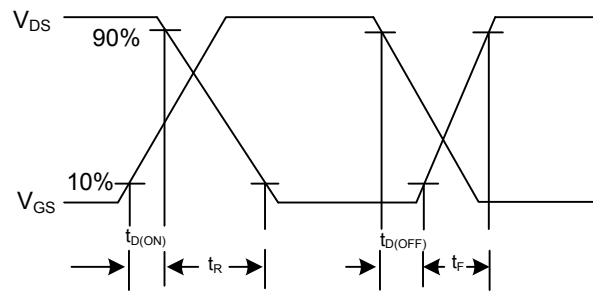


Peak Diode Recovery dv/dt Waveforms

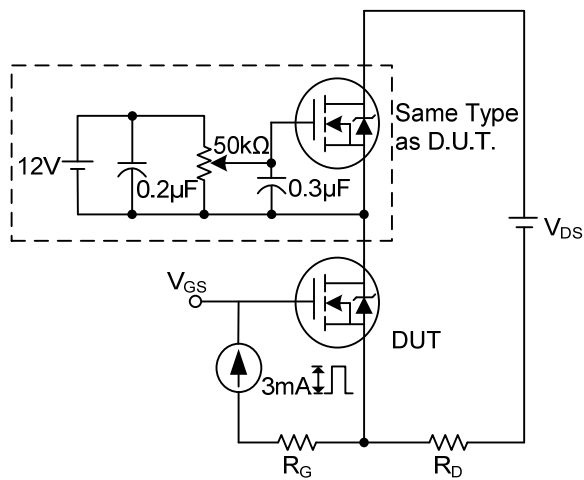
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



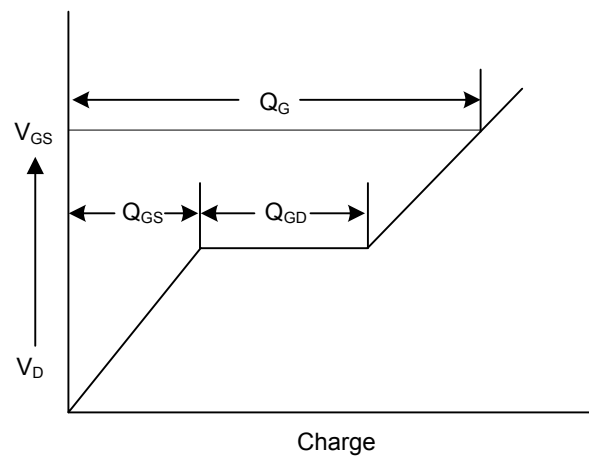
Switching Test Circuit



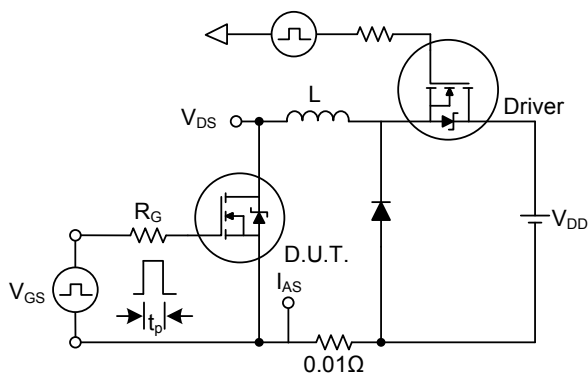
Switching Waveforms



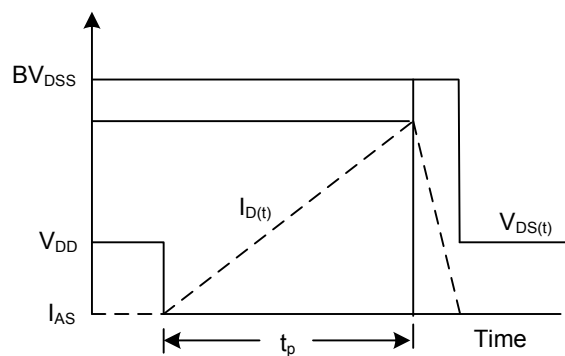
Gate Charge Test Circuit



Gate Charge Waveform

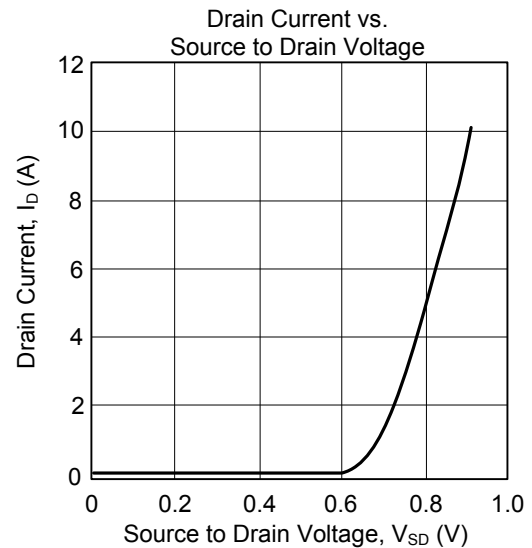
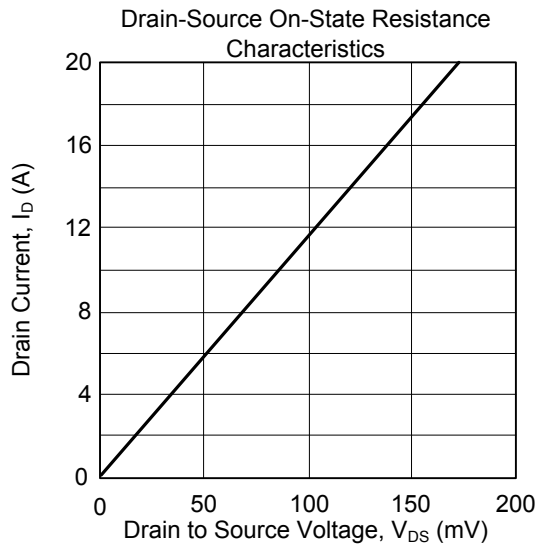
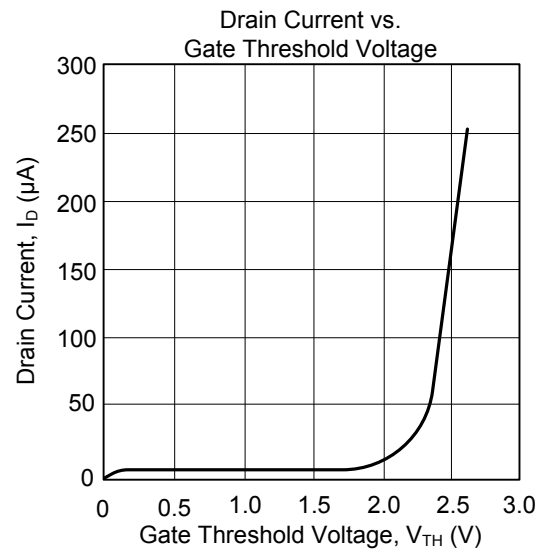
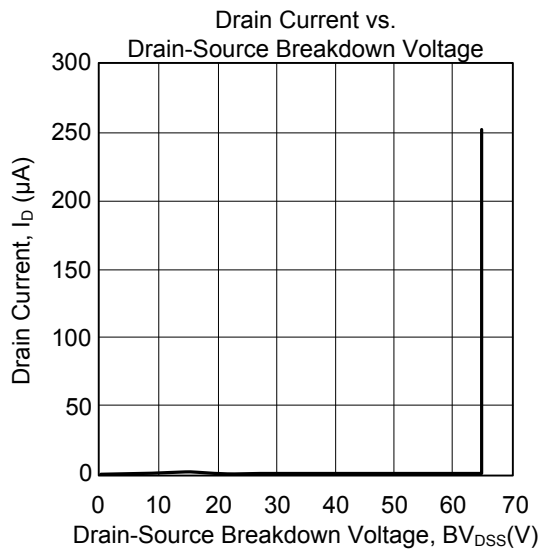


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS



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