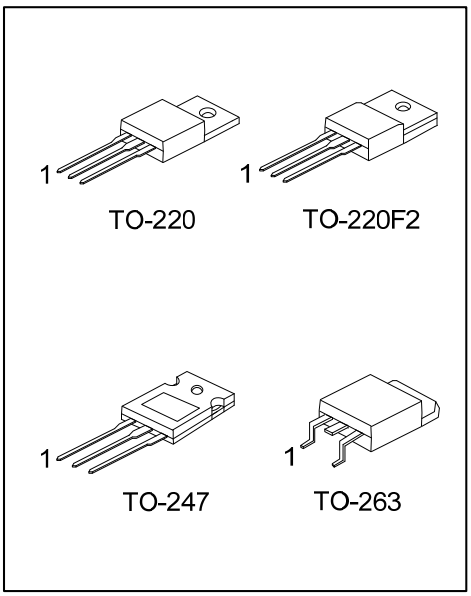
30A, 200V N-CHANNEL POWER MOSFET



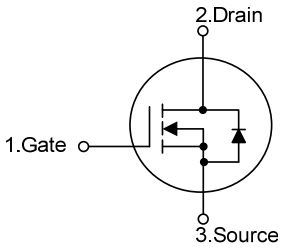
■ DESCRIPTION

The UTC **30N20** is an N-channel mode Power FET, it uses UTC's advanced technology. This technology allows a minimum on-state resistance, superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

■ FEATURES

* $R_{DS(ON)}$ < 75mΩ @ V_{GS}=10V, I_D=15A
* Low Gate Charge (Typical 60nC)
* High Switching Speed

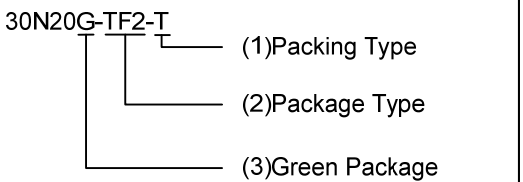
■ SYMBOL



■ ORDERING INFORMATION

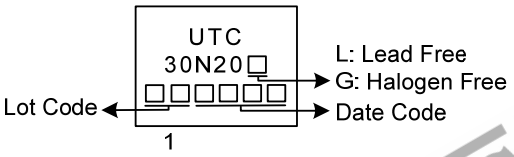
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
30N20L-TA3-T	30N20G-TF2-T	TO-220	G	D	S	Tube
30N20L-TF2-T	30N20G-TF2-T	TO-220F2	G	D	S	Tube
30N20L-T47-T	30N20G-T47-T	TO-247	G	D	S	Tube
30N20L-TQ2-T	30N20G-TQ2-T	TO-263	G	D	S	Tube
30N20L-TQ2-R	30N20G-TQ2-R	TO-263	G	D	S	Tape Reel

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



(1) T: Tube
(2) TA3: TO-220, TF2: TO-220F2, T47: TO-247
TQ2: TO-263
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	200	V
Gate-Source Voltage		V_{GSS}	±30	V
Drain Current	Continuous	I_D	30	A
	Pulsed	I_{DM}	90	A
Avalanche Energy	Single Pulsed	E_{AS}	640	mJ
Power Dissipation	TO-220/TO-263	P_D	140	W
	TO-220F2		40	W
	TO-247		214	W
Junction Temperature		T_J	+150	°C
Storage Temperature Range		T_{STG}	-55 ~ +150	°C

Note: 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.

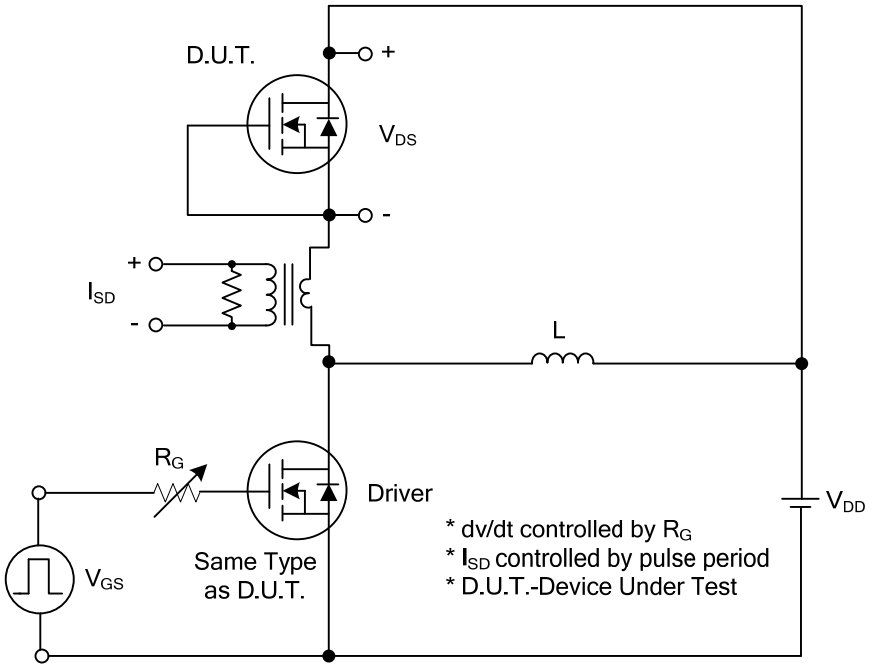
■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F2 TO-263	θ_{JA}	62.5	°C/W
	TO-247		40	°C/W
Junction to Case	TO-220/TO-263	θ_{JC}	0.89	°C/W
	TO-220F2		3.125	°C/W
	TO-247		0.58	°C/W

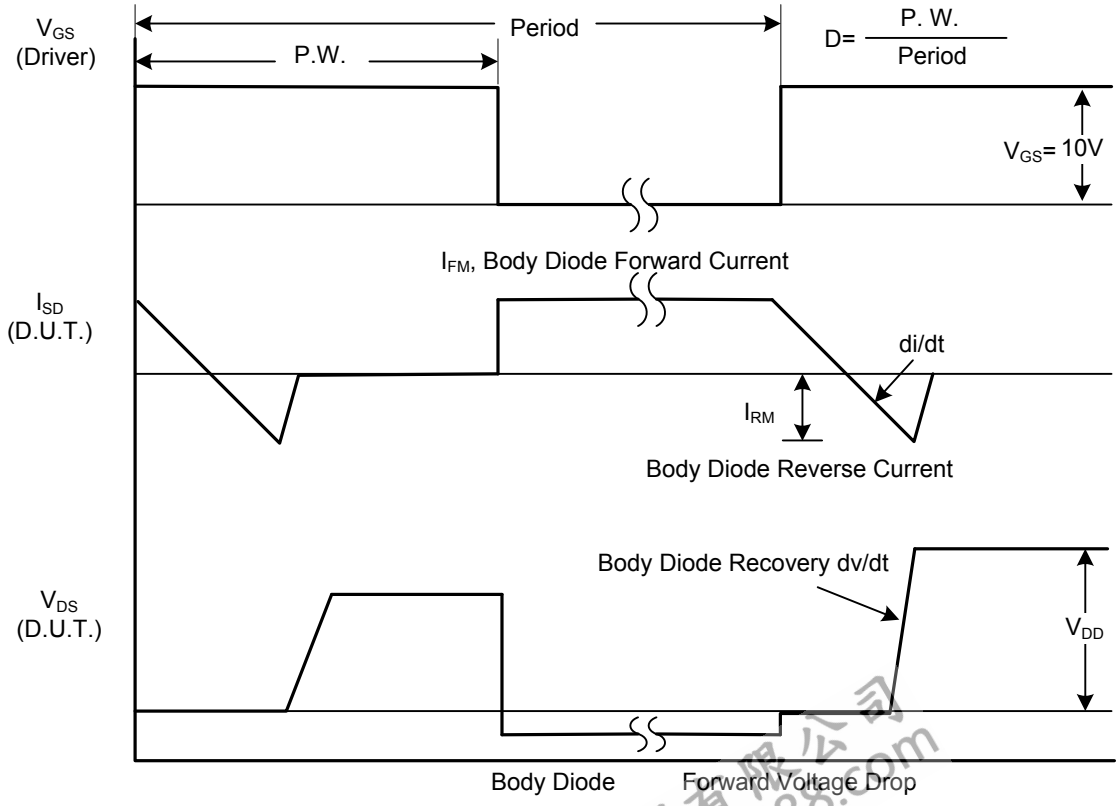
■ ELECTRICAL CHARACTERISTICS

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	200			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=200V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+30V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-30V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	I_D=250μA	1.5		3.5	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=15A			75	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1MHz		2400	3100	pF
Output Capacitance		C_{OSS}			430	560	pF
Reverse Transfer Capacitance		C_{RSS}			55	70	pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{DD}=50V, V_{GS}=10V , I_D=1.3A		60	78	nC
Gate to Source Charge		Q_{GS}			17		nC
Gate to 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}=0~10V		40		ns
Rise Time		t_R			280		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			125		ns
Fall-Time		t_F			115		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				30	A
Maximum Body-Diode Pulsed Current		I_{SM}				90	A
Drain-Source Diode Forward Voltage		V_{SD}	I_S=30A, V_{GS}=0V			1.5	V

■ TEST CIRCUITS AND WAVEFORMS

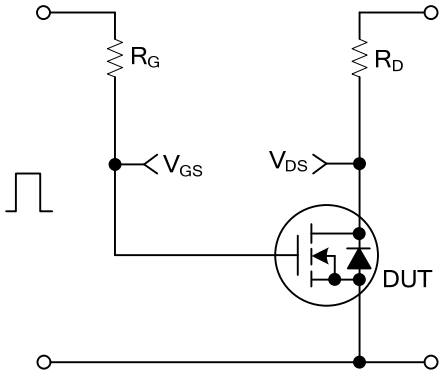


Peak Diode Recovery dv/dt Test Circuit



Peak Diode Recovery dv/dt Waveforms

■ TEST CIRCUITS AND WAVEFORMS



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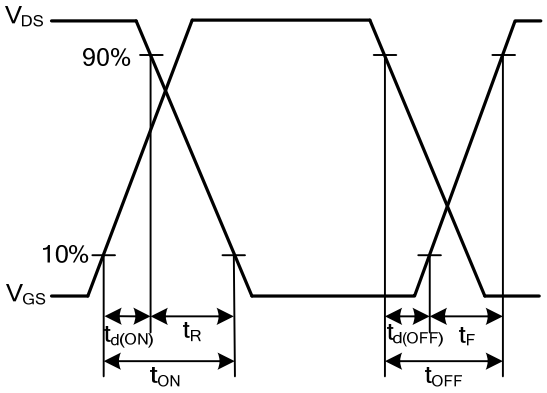
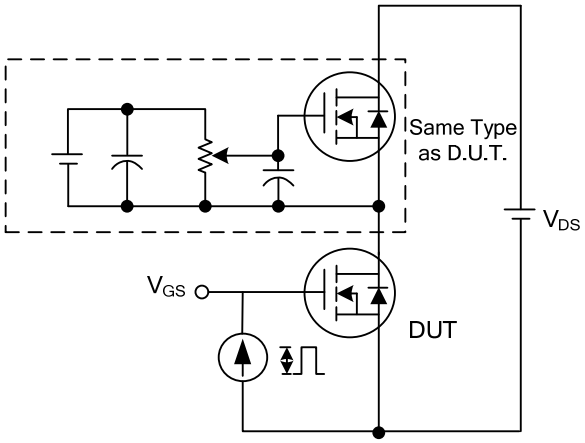
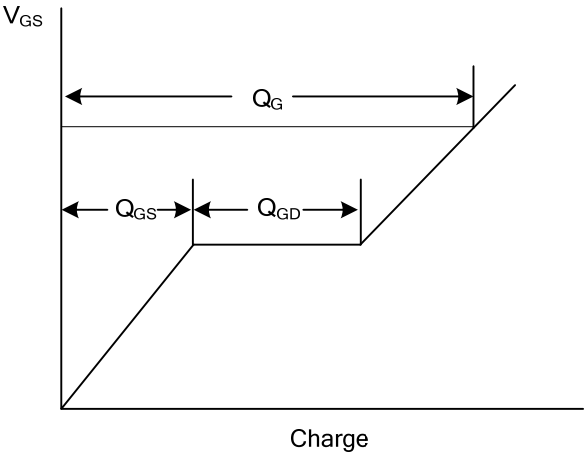


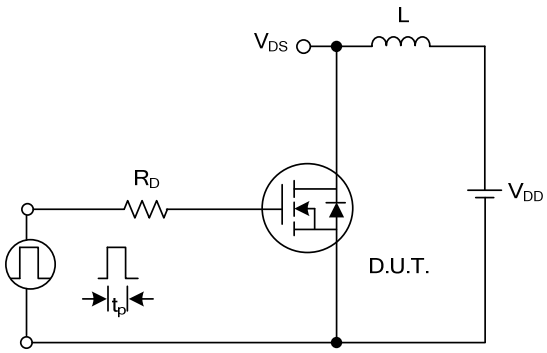
Switching Waveforms



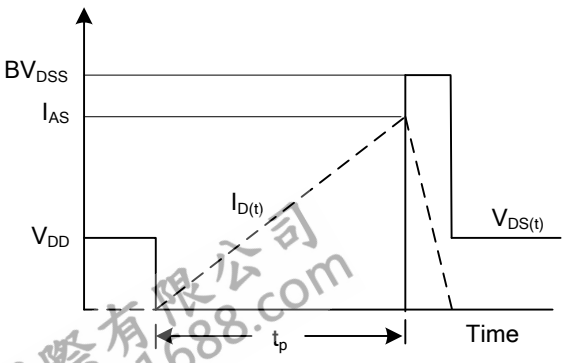
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms