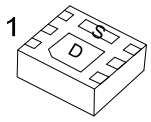
8.5A, 25V N-CHANNEL POWER MOSFET



DFN2020-6B

■ DESCRIPTION

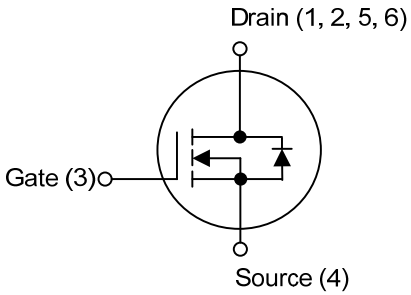
The UTC **UT8242** is a N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with low Rdson characteristic by high cell density trench technology.

The UTC **UT8242** is suitable for high efficiency synchronous rectification in SMPS, UPS, hard switched and high frequency circuits.

■ FEATURES

* $R_{DS(ON)}$ ≤ 13 mΩ @ V_{GS}=10V, I_D=8.5A
  $R_{DS(ON)}$ ≤ 21 mΩ @ V_{GS}=4.5V, I_D=6.8A
* High Cell Density Trench Technology
* High Power and Current Handling Capability

■ SYMBOL



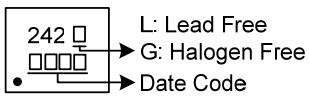
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5	6	
UT8242L-K06B-2020-R	UT8242G-K06B-2020-R	DFN2020-6B	D	D	G	S	D	D	Tape Reel

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

UT8242G-K06B-2020-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) K06B-2020: DFN2020-6B (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ ABSOLUTE MAXIMUM RATING (T_C=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	25	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	Continuous	I_D	8.5	A
	Pulsed (Note 2)	I_{DM}	26	A
Power Dissipation		P_D	2	W
Junction Temperature		T_J	+150	°C
Storage Temperature Range		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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62.5	°C/W

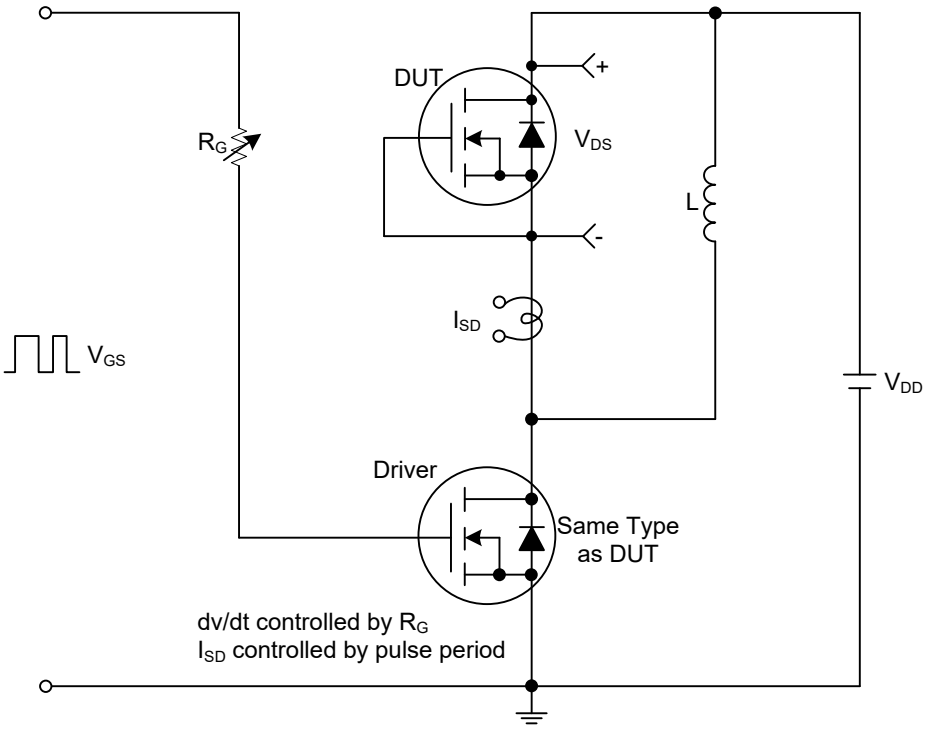
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

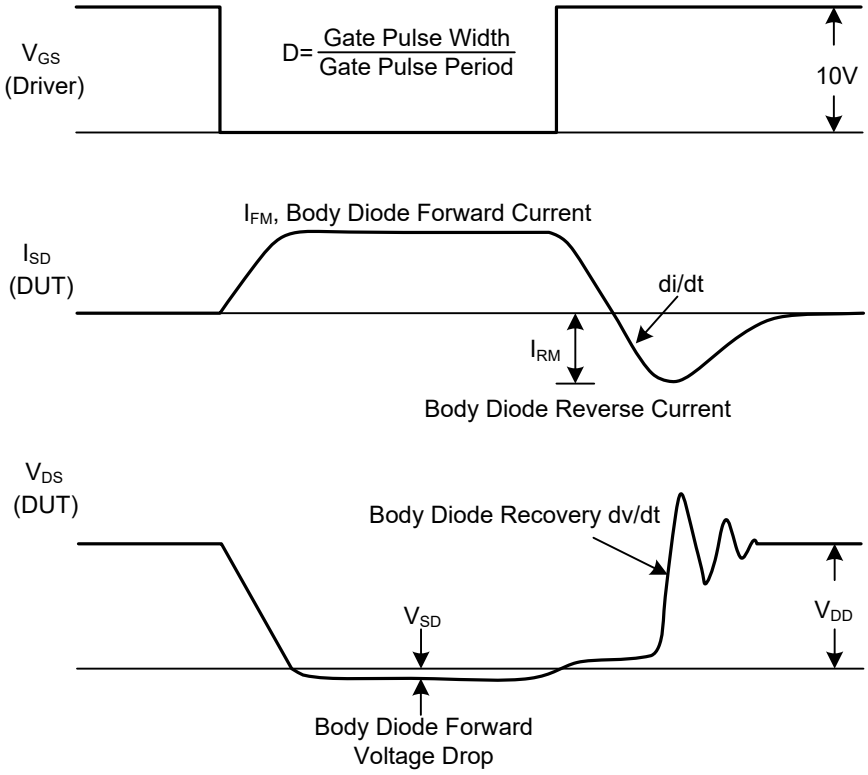
PARAMETER		SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS								
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V		25			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=25V, V_{GS}=0V				1.0	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V				+100	nA
	Reverse		V_{GS}=-20V, V_{DS}=0V				-100	nA
ON CHARACTERISTICS								
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA		1.0		3.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=8.5A				13	mΩ
			V_{GS}=4.5V, I_D=6.8A				21	mΩ
DYNAMIC PARAMETERS								
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=10V, f=1.0MHz			785		pF
Output Capacitance		C_{OSS}				315		pF
Reverse Transfer Capacitance		C_{RSS}				260		pF
SWITCHING PARAMETERS								
Total Gate Charge (Note 1)		Q_G	V_{DS}=13V, I_D=8.5A,	V_{GS}=4.5V,		15		nC
				V_{GS}=10V		30		nC
Gate to Source Charge		Q_{GS}	V_{DS}=13V, V_{GS}=10V, I_D=8.5A			4.6		nC
Gate to Drain Charge		Q_{GD}				7		nC
Turn-on Delay Time (Note 1)		$t_{D(ON)}$	V_{DS}=13V, V_{GS}=10V, I_D=8.5A, R_G=3Ω (Note 1, 2)			17		ns
Rise Time		t_R				31		ns
Turn-off Delay Time		$t_{D(OFF)}$				34		ns
Fall-Time		t_F				30		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS								
Maximum Body-Diode Continuous Current		I_S					8.5	A
Maximum Body-Diode Pulsed Current		I_{SM}					26	A
Drain-Source Diode Forward Voltage (Note 1)		V_{SD}	I_S=8.5A, V_{GS}=0V				1.4	V
Reverse Recovery Time (Note 1)		t_{rr}	I_S=8.5A, V_{GS}=0V, dI_F/dt =100A/μs			900		nS
Reverse Recovery Charge		Q_{rr}				3.2		uC

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

■ TEST CIRCUITS AND WAVEFORMS



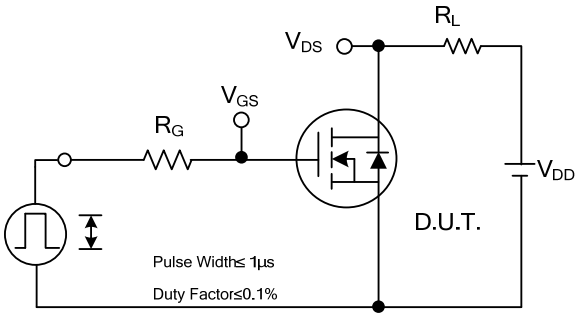
Peak Diode Recovery dv/dt Test Circuit



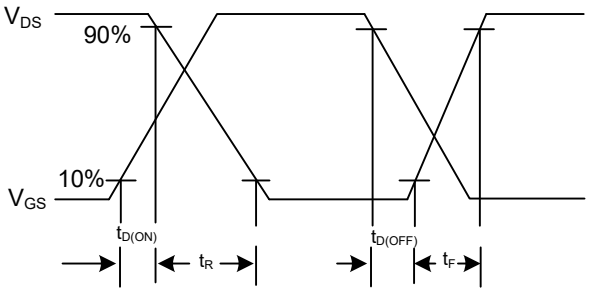
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

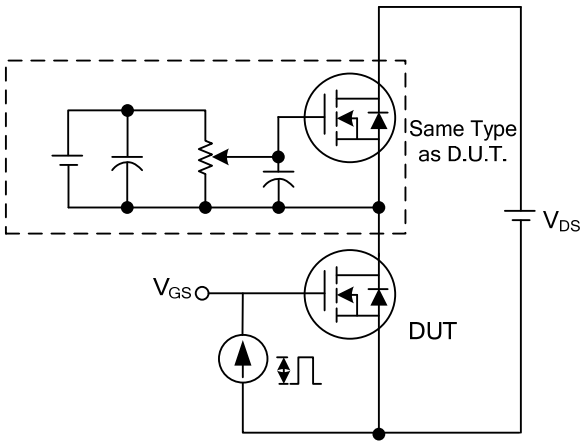
■ TEST CIRCUITS AND WAVEFORMS



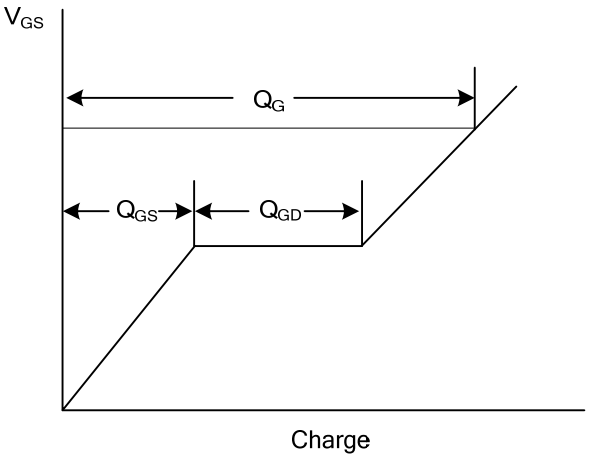
Switching Test Circuit



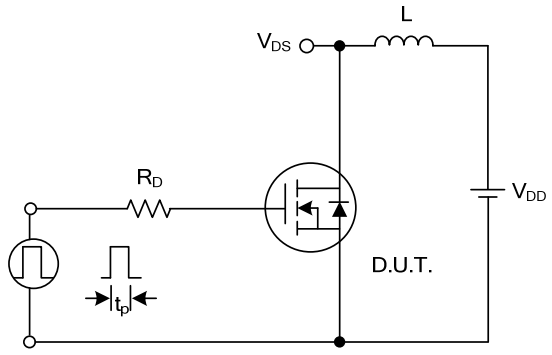
Switching Waveforms



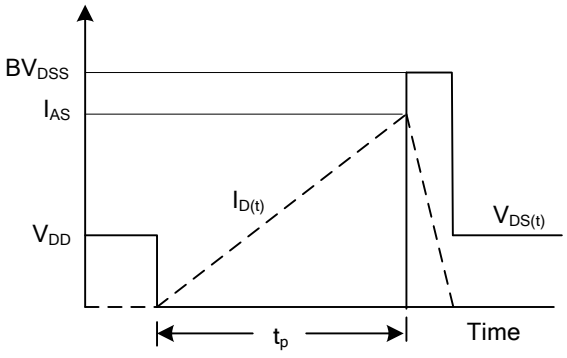
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms