



## UT8242

Preliminary

POWER MOSFET

## 8.5A, 25V N-CHANNEL POWER MOSFET

### DESCRIPTION

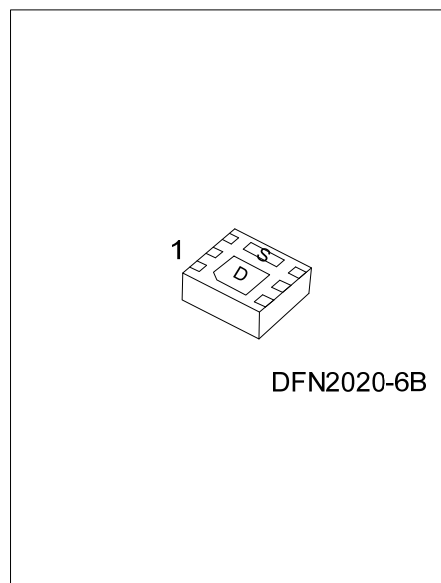
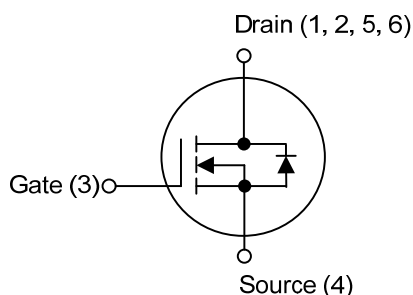
The UTC **UT8242** is a N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with low  $R_{DS(on)}$  characteristic by high cell density trench technology.

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

### FEATURES

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

### SYMBOL



DFN2020-6B

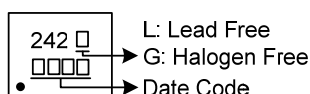
### ORDERING INFORMATION

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

### MARKING



■ ABSOLUTE MAXIMUM RATING ( $T_C=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		$V_{DS}$	25	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	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	$^{\circ}\text{C}$
Storage Temperature Range		$T_{STG}$	-55 ~ +150	$^{\circ}\text{C}$

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	$\theta_{JA}$	62.5	$^{\circ}\text{C/W}$

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

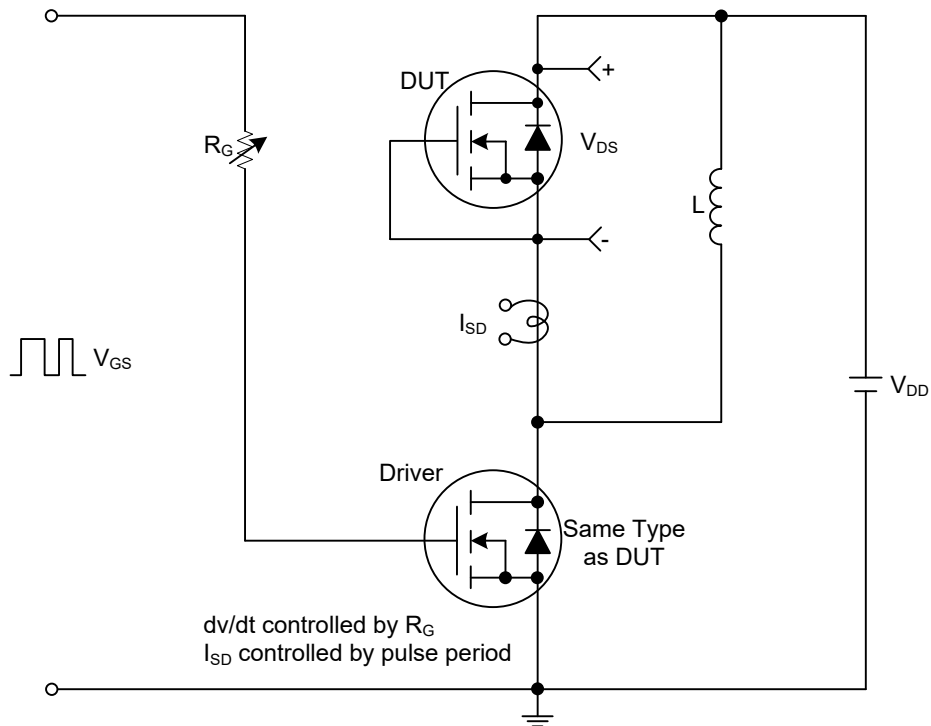
■ ELECTRICAL CHARACTERISTICS ( $T_J=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV <sub>DSS</sub>	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	25			V
Drain-Source Leakage Current		I <sub>DSS</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V			1.0	μA
Gate-Source Leakage Current	Forward	I <sub>GSS</sub>	V <sub>GS</sub> =+20V, V <sub>DS</sub> =0V			+100	nA
	Reverse		V <sub>GS</sub> =-20V, V <sub>DS</sub> =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0		3.0	V
Static Drain-Source On-State Resistance		R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =8.5A			13	mΩ
			V <sub>GS</sub> =4.5V, I <sub>D</sub> =6.8A			21	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =10V, f=1.0MHz		785		pF
Output Capacitance		C <sub>OSS</sub>			315		pF
Reverse Transfer Capacitance		C <sub>RSS</sub>			260		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q <sub>G</sub>	V <sub>DS</sub> =13V, I <sub>D</sub> =8.5A,	V <sub>GS</sub> =4.5V,		15	nC
				V <sub>GS</sub> =10V		30	nC
Gate to Source Charge		Q <sub>GS</sub>	V <sub>DS</sub> =13V, V <sub>GS</sub> =10V, I <sub>D</sub> =8.5A		4.6		nC
Gate to Drain Charge		Q <sub>GD</sub>			7		nC
Turn-on Delay Time (Note 1)		t <sub>D(ON)</sub>	V <sub>DS</sub> =13V, V <sub>GS</sub> =10V, I <sub>D</sub> =8.5A, R <sub>G</sub> =3Ω (Note 1, 2)		17		ns
Rise Time		t <sub>R</sub>			31		ns
Turn-off Delay Time		t <sub>D(OFF)</sub>			34		ns
Fall-Time		t <sub>F</sub>			30		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I <sub>S</sub>				8.5	A
Maximum Body-Diode Pulsed Current		I <sub>SM</sub>				26	A
Drain-Source Diode Forward Voltage (Note 1)		V <sub>SD</sub>	I <sub>S</sub> =8.5A, V <sub>GS</sub> =0V			1.4	V
Reverse Recovery Time (Note 1)		t <sub>rr</sub>	I <sub>S</sub> =8.5A, V <sub>GS</sub> =0V,		900		nS
Reverse Recovery Charge		Q <sub>rr</sub>	dI <sub>F</sub> /dt =100A/μs		3.2		uC

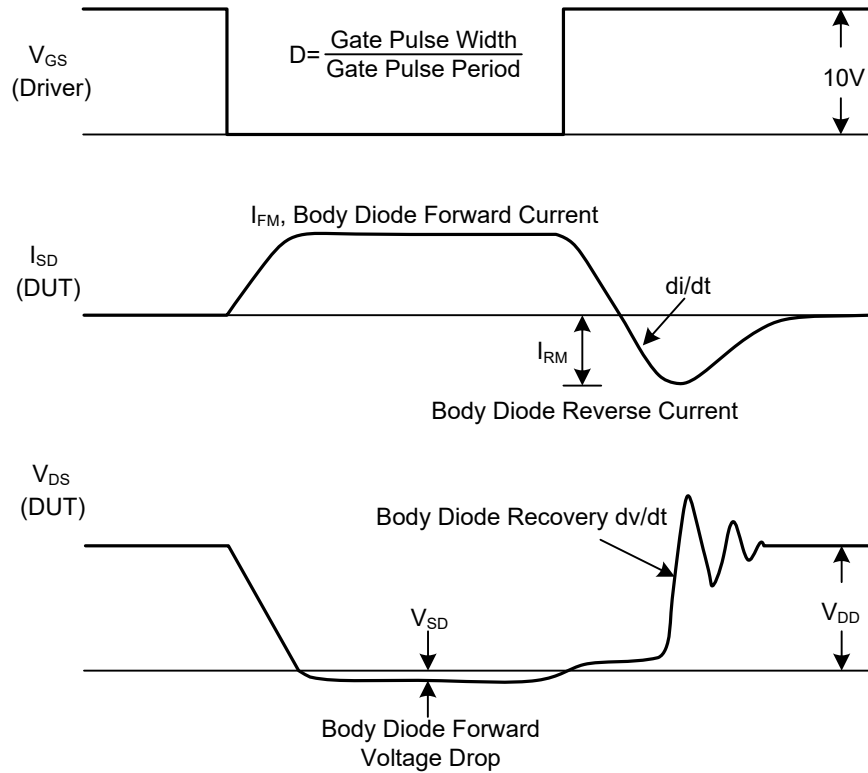
Notes: 1. Pulse Test: Pulse width  $\leq 300\mu\text{s}$ , Duty cycle  $\leq 2\%$ .

2. Essentially independent of operating ambient temperature.

# ■ TEST CIRCUITS AND WAVEFORMS



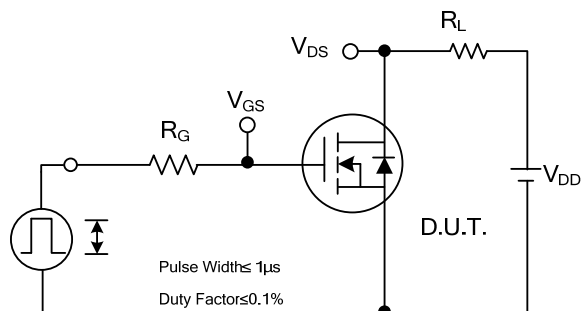
**Peak Diode Recovery  $dv/dt$  Test Circuit**



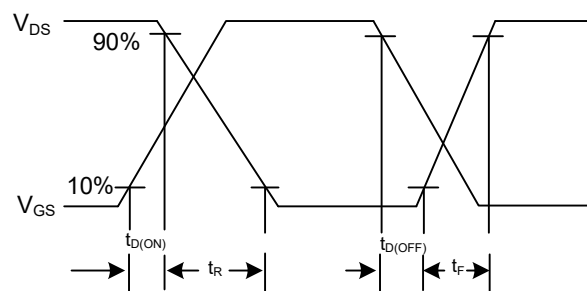
**Peak Diode Recovery  $dv/dt$  Test Circuit and Waveforms**

**Peak Diode Recovery  $dv/dt$  Waveforms**

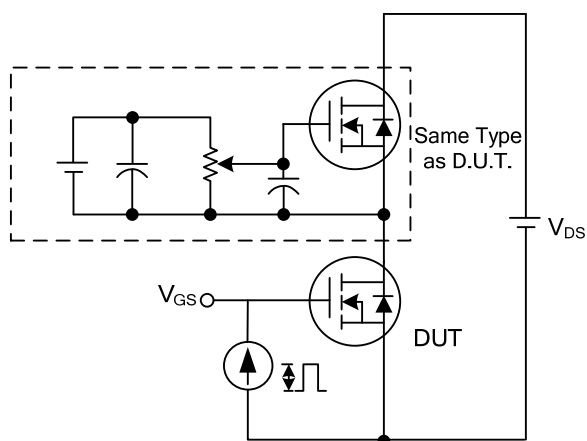
## ■ TEST CIRCUITS AND WAVEFORMS



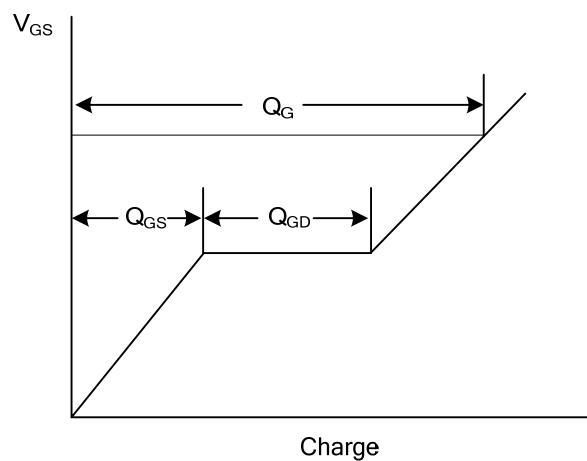
Switching Test Circuit



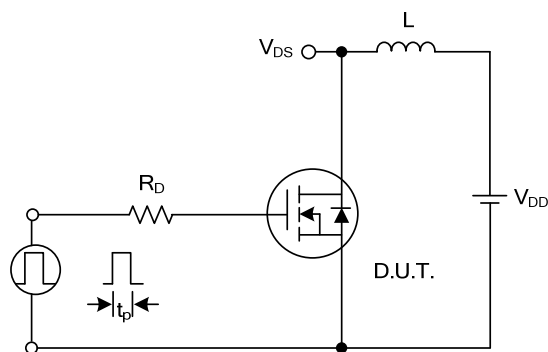
Switching Waveforms



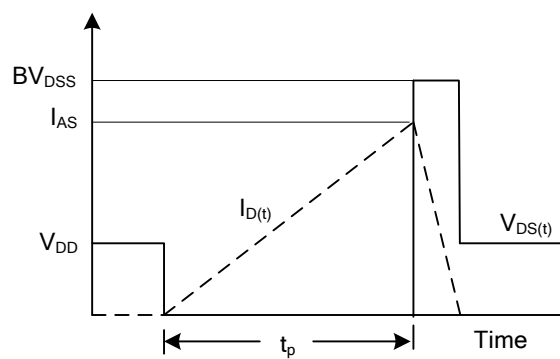
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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