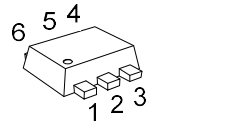
0.3A, 20V DUAL N-CHANNEL ENHANCEMENT MODE POWER MOSFET



SOT-563

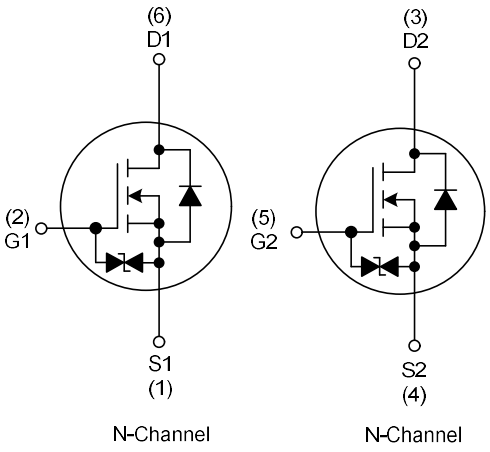
■ DESCRIPTION

The UTC **UT03NN02LZ** is a dual N-Channel enhancement mode power MOSFET, minimize the on-state resistance ($R_{DS(ON)}$) yet maintain superior switching performance, making it ideal for high efficiency power management applications, provides designer with fast switching speed, ruggedized device design, low on-resistance and cost-effectiveness.

■ FEATURES

* $R_{DS(on)}$ ≤ 1.0 Ω @ V_{GS}=4.5V, I_D=300mA
  $R_{DS(on)}$ ≤ 1.2 Ω @ V_{GS}=2.5V, I_D=300mA
  $R_{DS(on)}$ ≤ 1.5 Ω @ V_{GS}=1.8V, I_D=300mA
* Low Capacitance
* Low Gate Charge
* Fast Switching Capability
* With ESD protection

■ SYMBOL



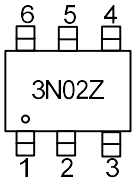
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5	6	
UT03NN02LZL-AN6-R	UT03NN02LZG-AN6-R	SOT-563	S1	G1	D2	S2	G2	D1	Tape Reel

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

UT03NN02LZG-AN6-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AN6: SOT-563 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	±8	V
Drain Current	Continuous	I_D	0.3	A
	Pulsed (Note 2)	I_{DM}	0.6	A
Power Dissipation		P_D	0.15	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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	833	°C/W

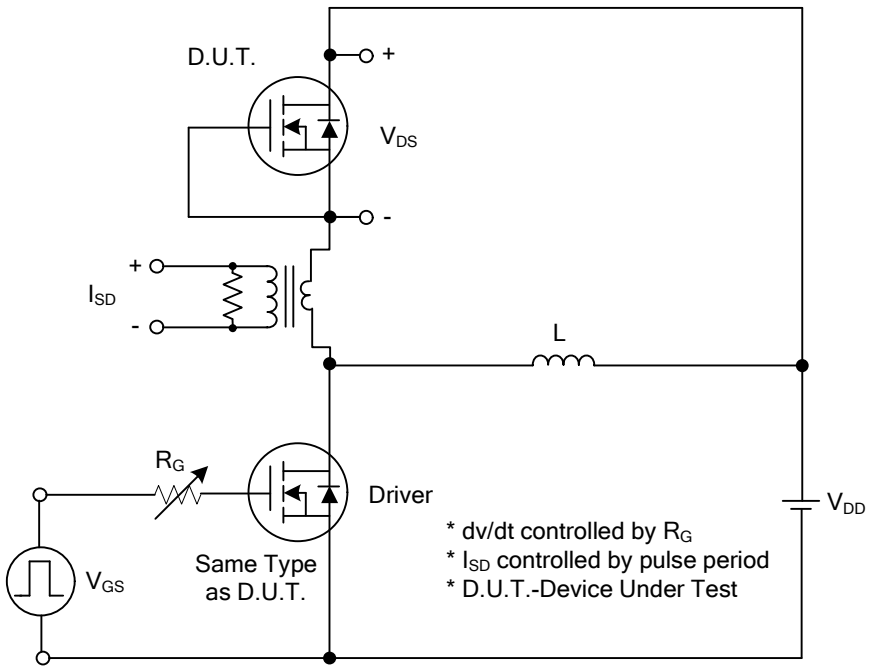
Note: Device mounted on FR-4 substrate P_C board, 2oz copper, with 1inch square copper plate.

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

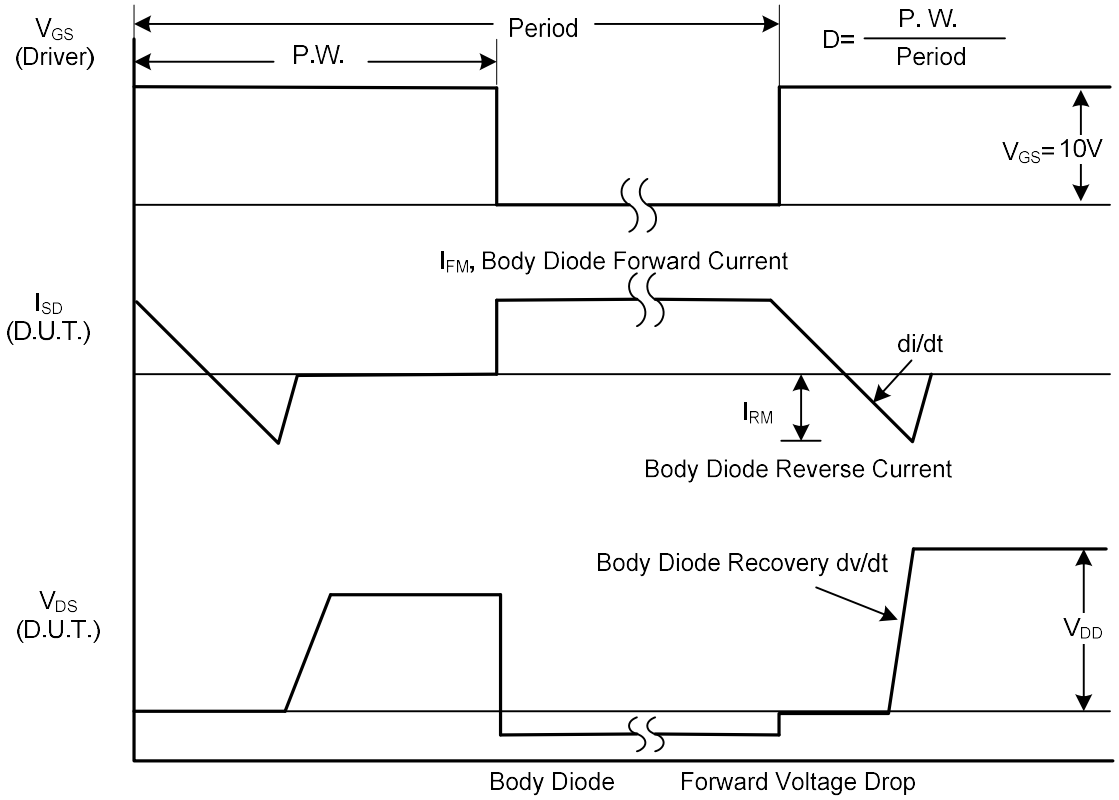
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{DS}=0V	20			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=20V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{DS}=0V, V_{GS}=+8V			10	μA
	Reverse		V_{DS}=0V, V_{GS}=-8V			-10	μA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}= V_{GS}, I_D=250μA	0.3		1.2	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=4.5V, I_D=300mA			1.0	Ω
			V_{GS}=2.5V, I_D=300mA			1.2	Ω
			V_{GS}=1.8V, I_D=300mA			1.5	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=10V, f=1MHz		19		pF
Output Capacitance		C_{OSS}			12		pF
Reverse Transfer Capacitance		C_{RSS}			6		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q_G	V_{DD}=16V, V_{GS}=10V, I_D=0.3A (Note 1, 2)		8.4		nC
Gate to Source Charge		Q_{GS}			0.67		nC
Gate to Drain Charge		Q_{GD}			0.69		nC
Turn-ON Delay Time (Note 1)		$t_{D(ON)}$	V_{DD}=10V, V_{GS}=10V, I_D=0.3A, R_G=3Ω (Note 1, 2)		3		ns
Rise Time		t_R			16		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			12		ns
Fall-Time		t_F			30		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I_S				0.3	A
Drain-Source Diode Forward Voltage (Note 1)		V_{SD}	I_S=0.3A, V_{GS}=0V			1.2	V

Notes: 1. Pulse Test: Pulse width ≤ 0.3μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

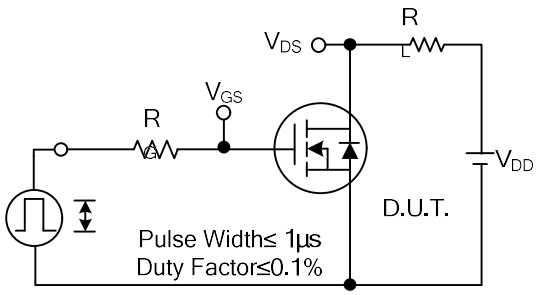


Peak Diode Recovery dv/dt Test Circuit

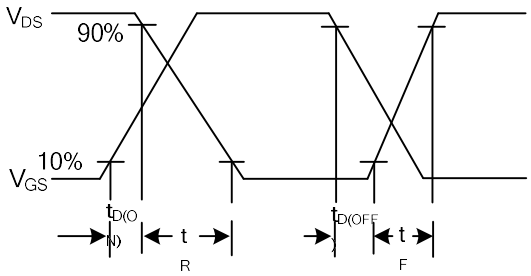


Peak Diode Recovery dv/dt Waveforms

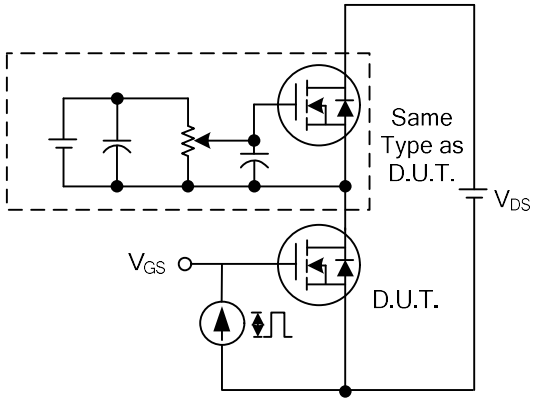
■ TEST CIRCUITS AND WAVEFORMS



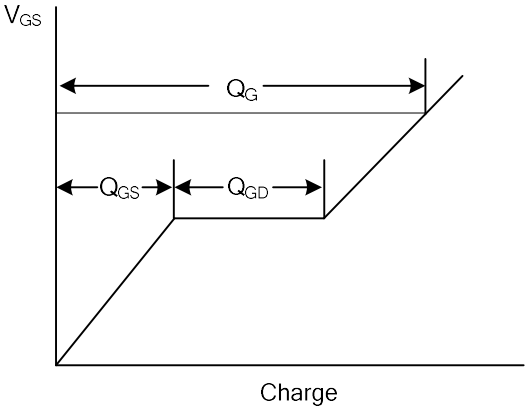
Switching Test Circuit



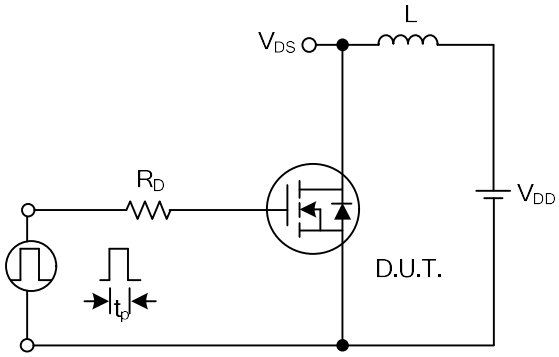
Switching Waveforms



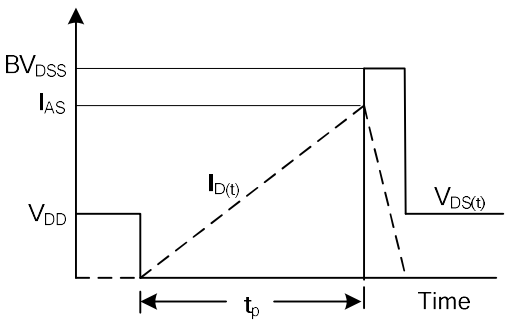
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms