



UT35N02

Preliminary

Power MOSFET

**35A, 20V N-CHANNEL
POWER MOSFET**

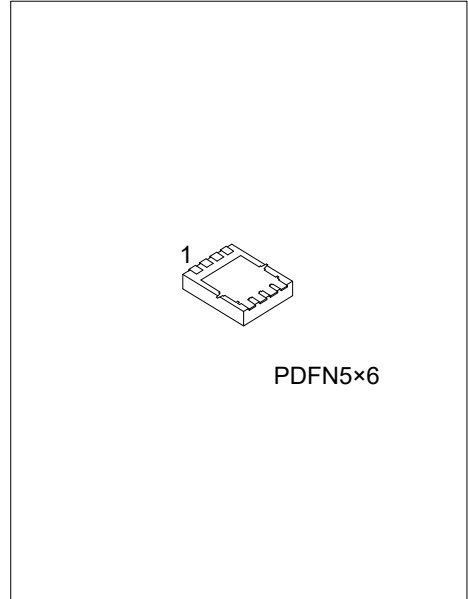
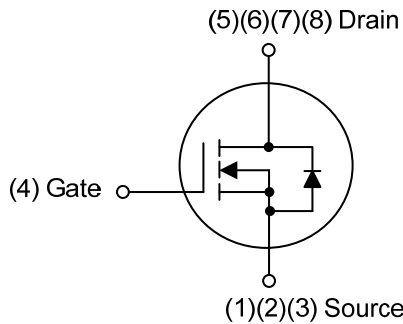
■ DESCRIPTION

The UTC **UT35N02** is a N-channel enhancement MOSFET using UTC's advanced technology to provide the customers with perfect $R_{DS(ON)}$ and high switching speed.

■ FEATURES

- * $R_{DS(ON)} \leq 4.5 \text{ m}\Omega @ V_{GS}=10\text{V}, I_D=20\text{A}$
- $R_{DS(ON)} \leq 5.0 \text{ m}\Omega @ V_{GS}=4.5\text{V}, I_D=10\text{A}$
- * High Switching Speed

■ SYMBOL



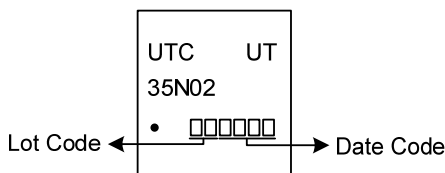
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment					Packing			
Lead Free	Halogen Free		1	2	3	4	5		6	7	8
UT35N02L-P5060-R	UT35N02G-P5060-R	PDFN5x6	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT35N02G-P5060-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) P5060: PDFN5x6</p> <p>(3) G: Halogen Free and Lead Free, K: Lead Free</p>
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■ MARKING



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	Continuous ($V_{GS}=10V$)	I_D	35	A
	Pulsed(Note 2)	I_{DM}	70	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	121	mJ
Power Dissipation		P_D	34	W
Junction Temperature		T_J	+150	$^{\circ}C$
Storage Temperature		T_{STG}	-55 ~ +175	$^{\circ}C$

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.

3. $L = 1mH$, $I_{AS} = 15.6A$, $V_{DD} = 90V$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}C$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	65	$^{\circ}C/W$
Junction to Case	θ_{JC}	3.68	$^{\circ}C/W$

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

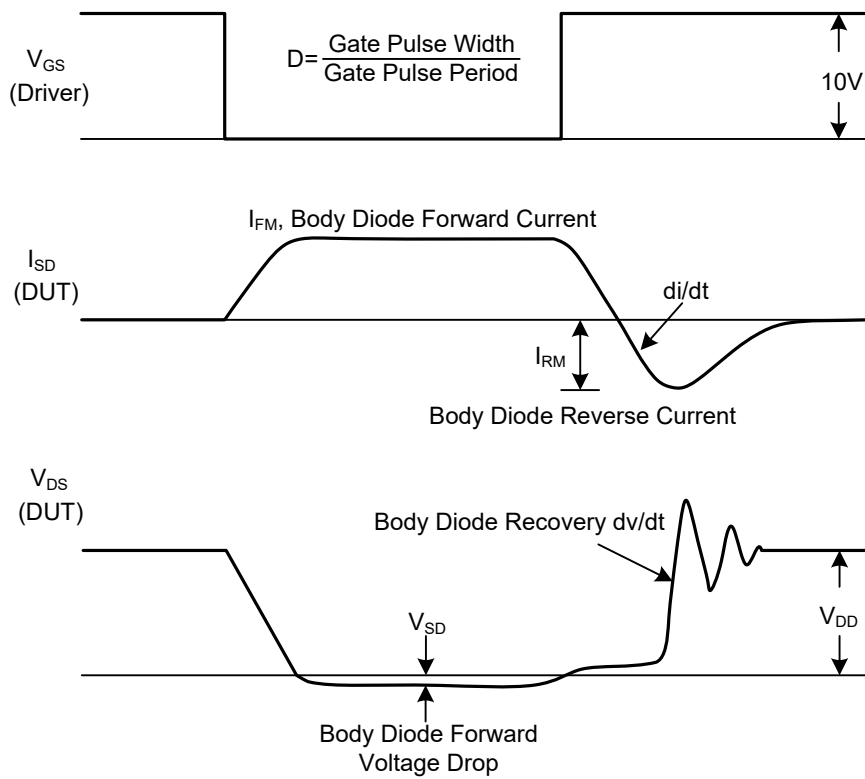
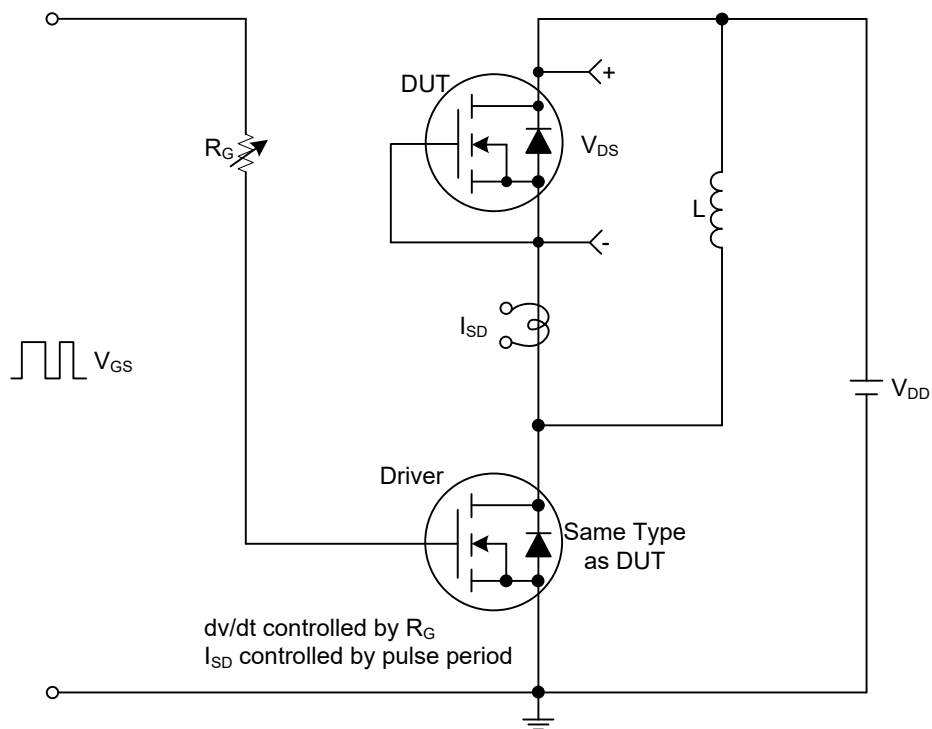
■ ELECTRICAL CHARACTERISTICS ($T_J=25^{\circ}C$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	20			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$			1	μA
Gate- Source Leakage Current	Forward	I_{GSS} $V_{GS}=+20V, V_{DS}=0V$ $V_{GS}=-20V, V_{DS}=0V$			+100	nA
	Reverse				-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0		3.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$			4.5	m Ω
		$V_{GS}=4.5V, I_D=10A$			5.0	m Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0V, V_{DS}=15V, f=1.0MHz$		2743		pF
Output Capacitance	C_{OSS}			770		pF
Reverse Transfer Capacitance	C_{RSS}			674		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{DS}=16V, V_{GS}=10V, I_D=35A$ (Note 1, 2)		76		nC
Gate to Source Charge	Q_{GS}			7		nC
Gate to Drain Charge	Q_{GD}			29		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=10V, V_{GS}=10V, I_D=35A,$ $R_G=3.3\Omega$, (Note 1, 2)		12		ns
Rise Time	t_R			19		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			72		ns
Fall-Time	t_F			67		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				35	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				70	A
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=35A, V_{GS}=0V$			1.4	V

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

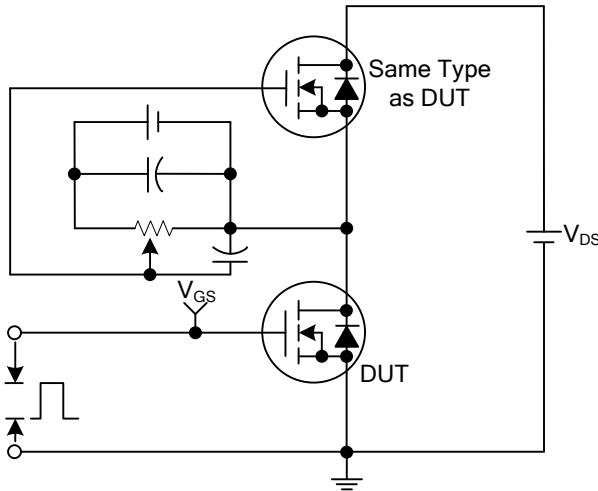
2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS

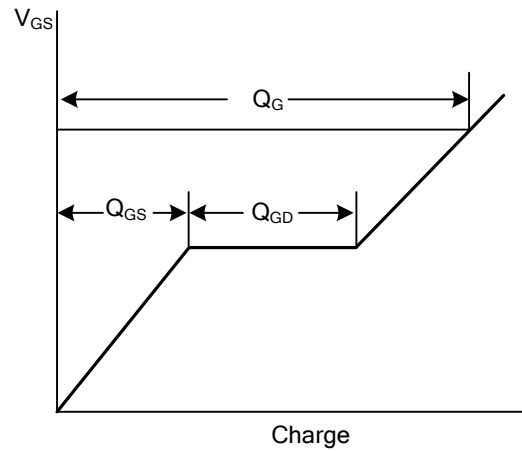


Peak Diode Recovery dv/dt Test Circuit and Waveforms

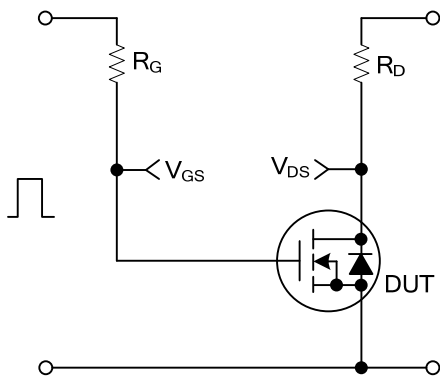
■ TEST CIRCUITS AND WAVEFORMS



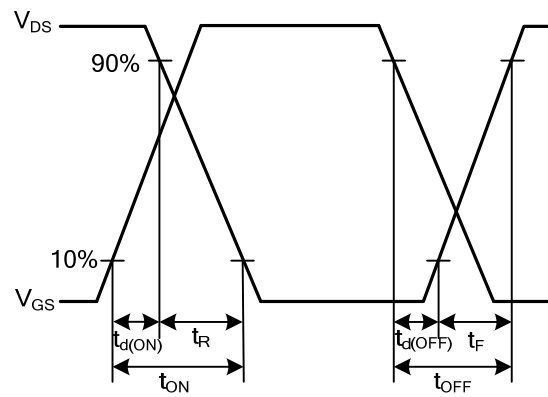
Gate Charge Test Circuit



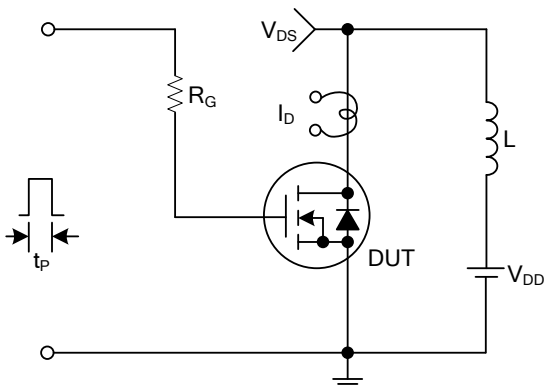
Gate Charge Waveforms



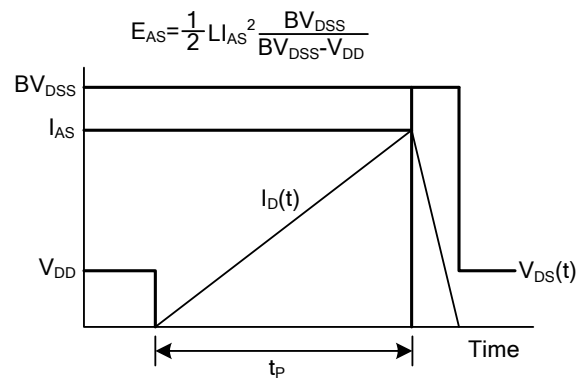
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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