



03N60-CB

Power MOSFET

0.3A, 600V N-CHANNEL POWER MOSFET

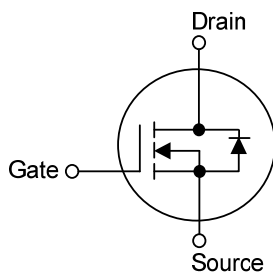
DESCRIPTION

The UTC **03N60-CB** is a high voltage power MOSFET and is designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and have a high rugged avalanche characteristics. This power MOSFET is usually used at high speed switching applications in power supplies, PWM motor controls, high efficient DC to DC converters and bridge circuits.

FEATURES

- * $R_{DS(on)} \leq 24\Omega$ @ $V_{GS}=10V, I_D=0.15A$
- * High Switching Speed
- * High Cell Density Trench Technology

SYMBOL

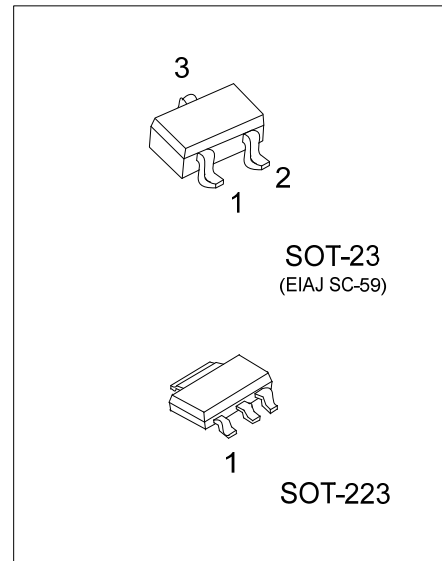


ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
03N60L-AA3-R	03N60G-AA3-R	SOT-223	G	D	S	Tape Reel
03N60L-AE3-R	03N60G-AE3-R	SOT-23	G	S	D	Tape Reel

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

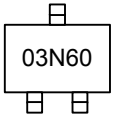
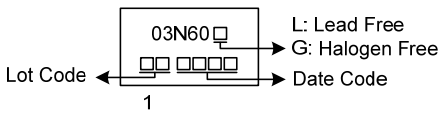
03N60G-AA3-R	(1)Packing Type	(1) R: Tape Reel
	(2)Package Type	(2) AA3: SOT-223, AE3: SOT-23
	(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free



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MARKING

SOT-23	SOT-223
	

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	600	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	Continuous	I_D	0.3	A
	Pulsed	I_{DM}	1.2	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	7.3	mJ
Power Dissipation	SOT-223	P_D	5.0	W
	SOT-23		0.9	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.

3. $L=30\text{mH}$, $I_{AS}=0.7\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\ \Omega$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-223	θ_{JA}	150	$^\circ\text{C/W}$
	SOT-23		180	$^\circ\text{C/W}$
Junction to Case	SOT-223	θ_{JC}	25	$^\circ\text{C/W}$
	SOT-23		135	$^\circ\text{C/W}$

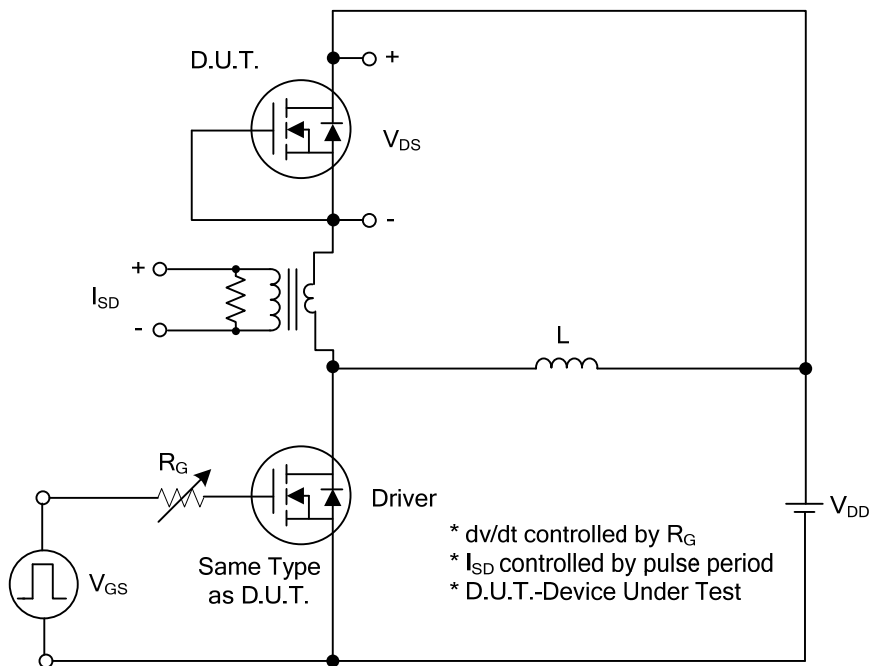
■ ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	$I_D=250\ \mu\text{A}$, $V_{GS}=0\text{V}$	600			V
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=600\text{V}$, $V_{GS}=0\text{V}$			10	μA
Gate-Source Leakage Current	Forward	I_{GSS}	$V_{GS}=+30\text{V}$, $V_{DS}=0\text{V}$			+100	nA
	Reverse		$V_{GS}=-30\text{V}$, $V_{DS}=0\text{V}$			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\ \mu\text{A}$	2.0		4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=0.15\text{A}$			24	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$		60		pF
Output Capacitance		C_{OSS}			11		pF
Reverse Transfer Capacitance		C_{RSS}			4.8		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q_G	$V_{DS}=50\text{V}$, $V_{GS}=10\text{V}$, $I_D=0.3\text{A}$, $I_D=100\ \mu\text{A}$ (Note 1, 2)		4.0		nC
Gate to Source Charge		Q_{GS}			0.8		nC
Gate to Drain Charge		Q_{GD}			0.6		nC
Turn-on Delay Time (Note 1)		$t_{D(ON)}$	$V_{DS}=30\text{V}$, $V_{GS}=10\text{V}$, $I_D=0.3\text{A}$, $R_G=25\ \Omega$ (Note 1, 2)		28		ns
Rise Time		t_R			14		ns
Turn-off Delay Time		$t_{D(OFF)}$			46		ns
Fall-Time		t_F			20		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				0.3	A
Maximum Body-Diode Pulsed Current		I_{SM}				1.2	A
Drain-Source Diode Forward Voltage (Note 1)		V_{SD}	$I_S=0.3\text{A}$, $V_{GS}=0\text{V}$			1.4	V

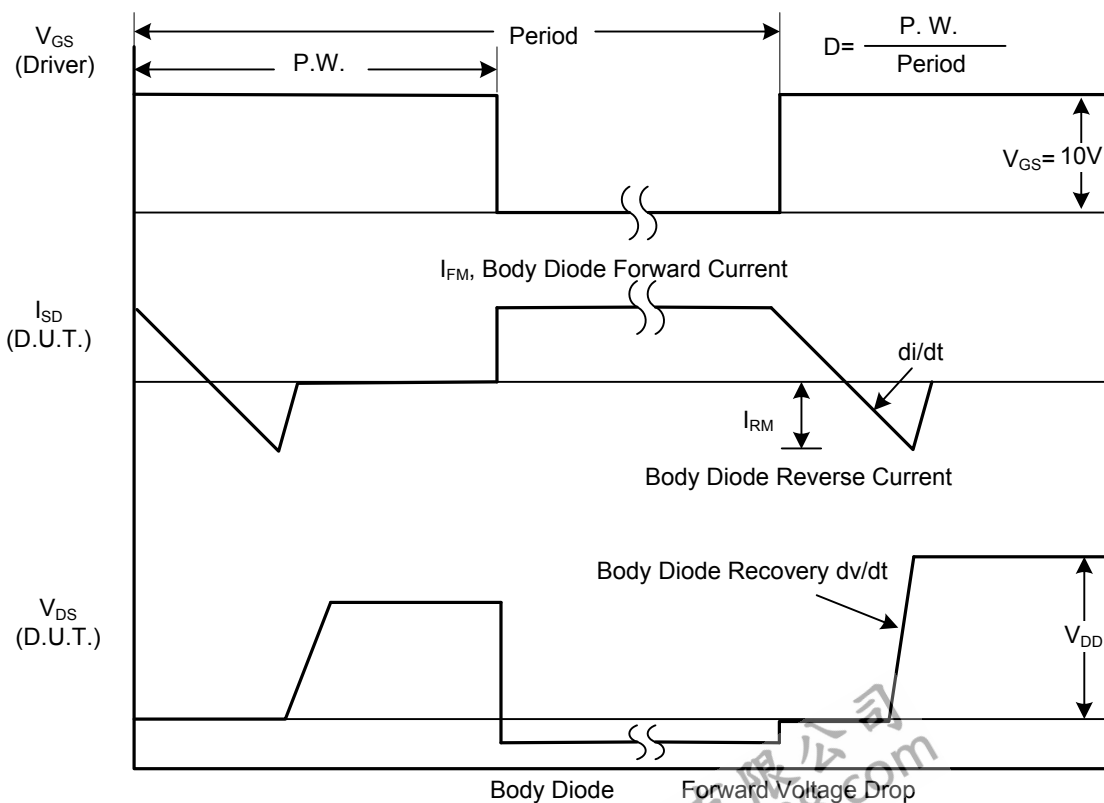
Notes: 1. Pulse Test: Pulse width $\leq 300\ \mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

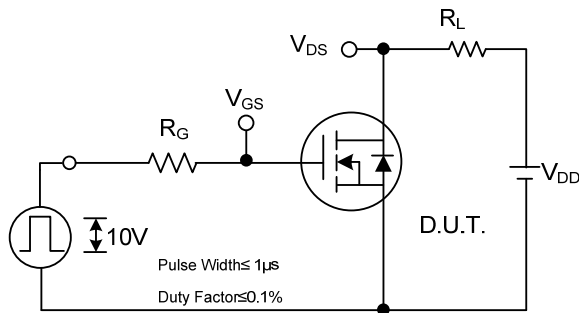


Peak Diode Recovery dv/dt Test Circuit

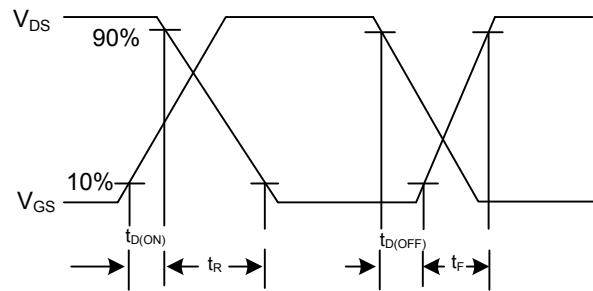


Peak Diode Recovery dv/dt Waveforms

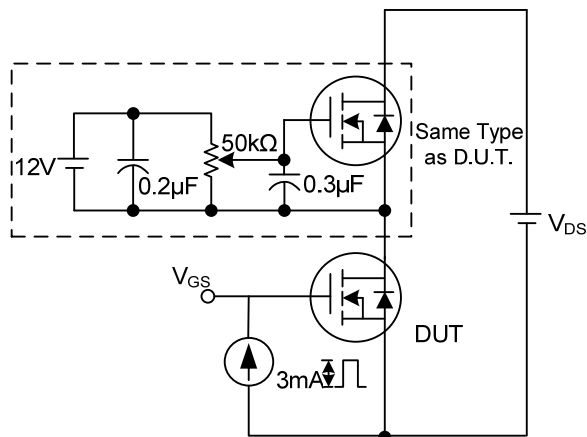
TEST CIRCUITS AND WAVEFORMS (Cont.)



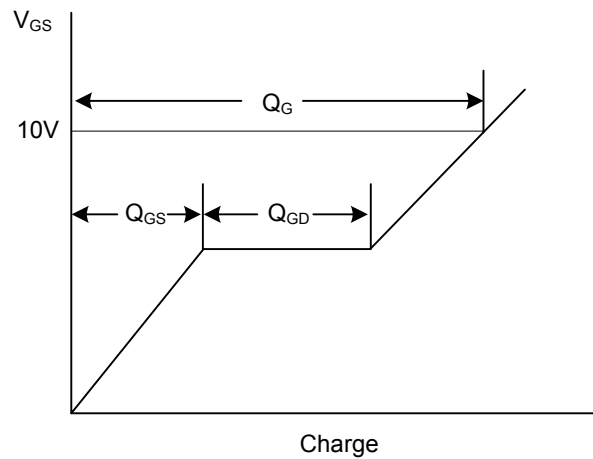
Switching Test Circuit



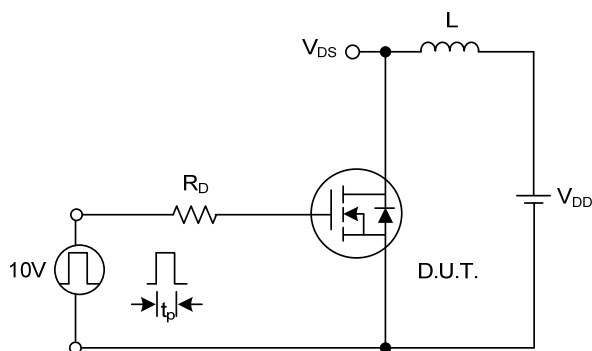
Switching Waveforms



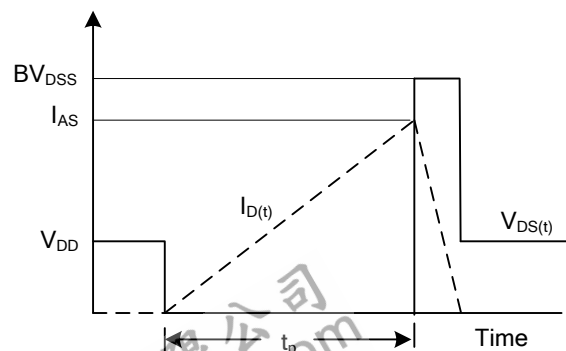
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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