



05N45

Preliminary

Power MOSFET

0.5A, 450V N-CHANNEL POWER MOSFET

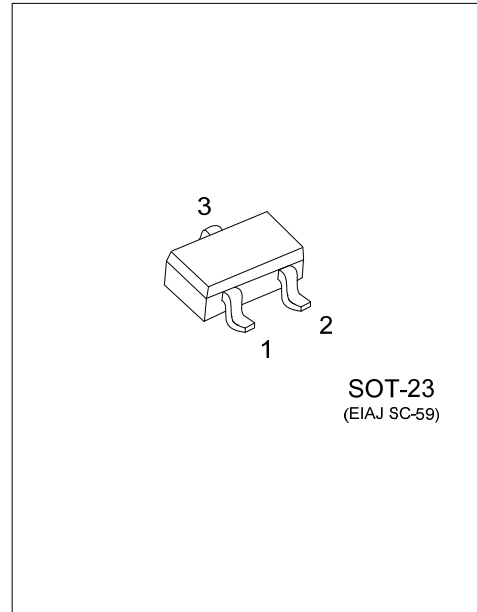
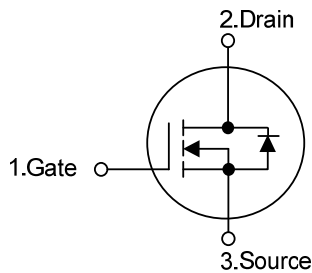
DESCRIPTION

The UTC **05N45** is an N-channel mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance, low gate charge and superior switching performance.

FEATURES

- * $R_{DS(ON)} \leq 11\Omega @ V_{GS}=10V, I_D=0.25A$
- * High switching speed
- * 100% avalanche tested

SYMBOL



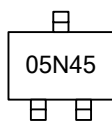
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
05N45L-AE3-R	05N45G-AE3-R	SOT-23	G	S	D	Tape Reel

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

<p>05N45G-AE3-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) AE3: SOT-23</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



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

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DS}	450	V
Gate-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current	I_D	0.5	A
Pulsed Drain Current (Note 2)	I_{DM}	2.0	A
Power Dissipation	P_D	1.14	W
Junction Temperature	T_J	+150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$

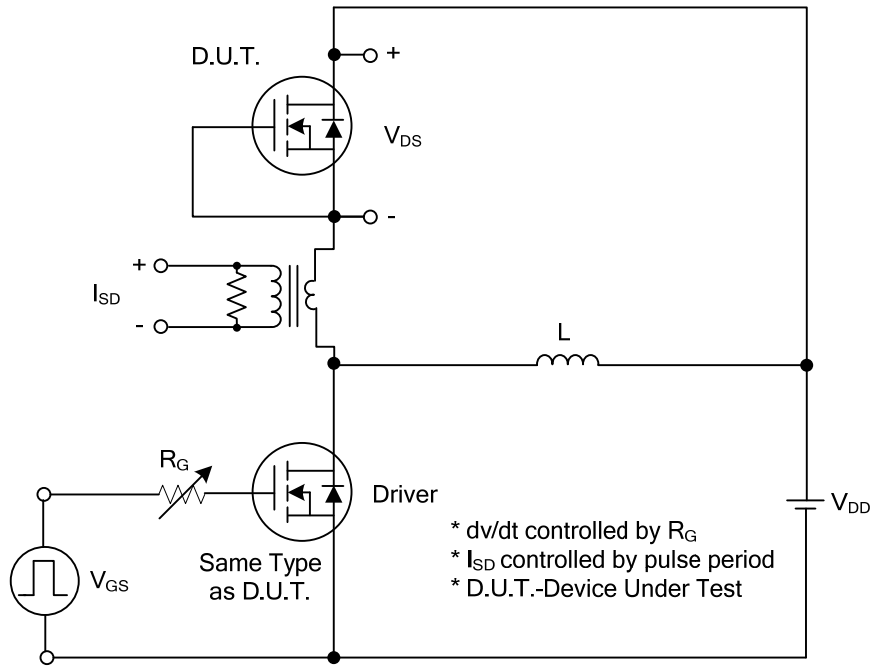
Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. Repetitive Rating: Pulse width limited by maximum junction temperature.

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

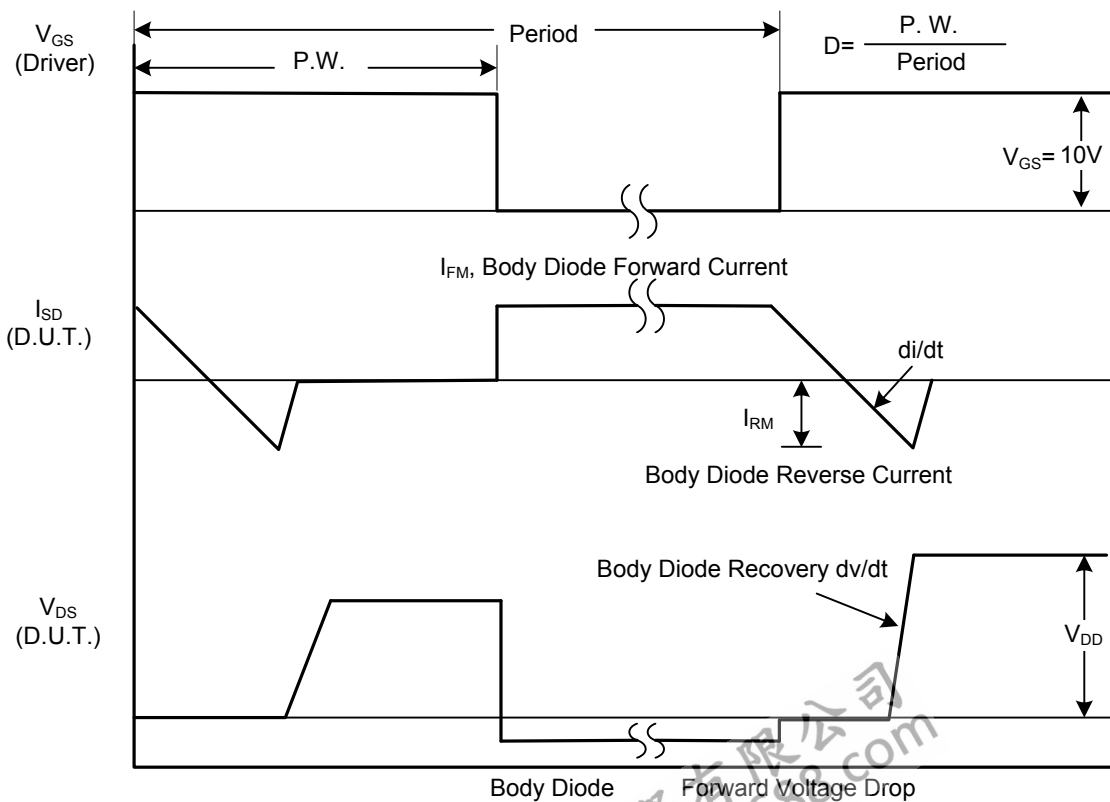
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{DS}=0\text{V}$	450			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=450\text{V}$			1	μA
Gate-Source Leakage Current	I_{GSS}	Forward			100	nA
		Reverse			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$I_D=250\mu\text{A}$	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=0.25\text{A}$			11	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1\text{MHz}$		172		pF
Output Capacitance	C_{OSS}			17		pF
Reverse Transfer Capacitance	C_{RSS}			4.6		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note 1)	Q_G	$V_{DS}=50\text{V}$, $V_{GS}=10\text{V}$, $I_D=1.3\text{A}$ $I_G=100\mu\text{A}$ (Note 1, 2)		12		nC
Gate to Source Charge	Q_{GS}			0.8		nC
Gate to Drain Charge	Q_{GD}			0.8		nC
Turn-ON Delay Time (Note 1)	$t_{D(ON)}$	$V_{DS}=30\text{V}$, $V_{GS}=10\text{V}$, $I_D=0.5\text{A}$, $R_G=25\Omega$ (Note 1, 2)		14		ns
Rise Time	t_R			26		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			86		ns
Fall-Time	t_F			51		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				0.5	A
Maximum Body-Diode Pulsed Current	I_{SM}				2.0	A
Drain-Source Diode Forward Voltage (Note 1)	V_{SD}	$I_S=0.5\text{A}$, $V_{GS}=0\text{V}$			1.4	V

Notes: 1. Pulse Test : Pulse width $\leq 450\mu\text{s}$, Duty cycle $\leq 2\%$.
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

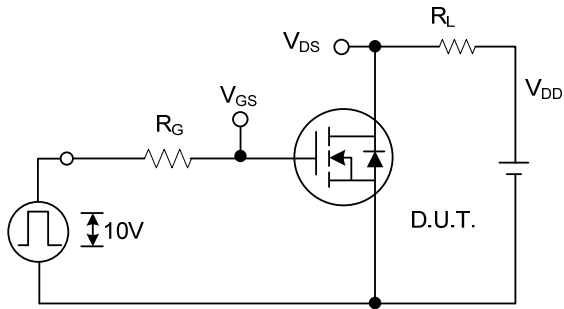


Peak Diode Recovery dv/dt Test Circuit

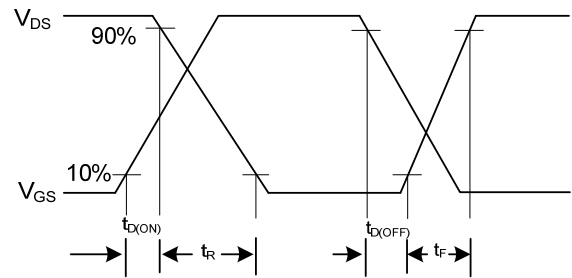


Peak Diode Recovery dv/dt Waveforms

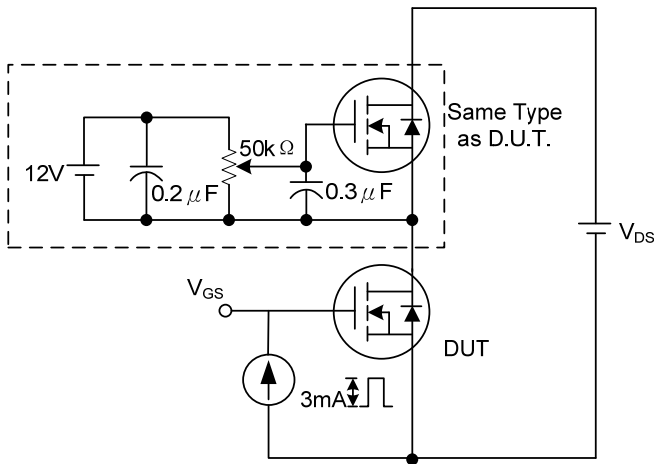
■ TEST CIRCUITS AND WAVEFORMS



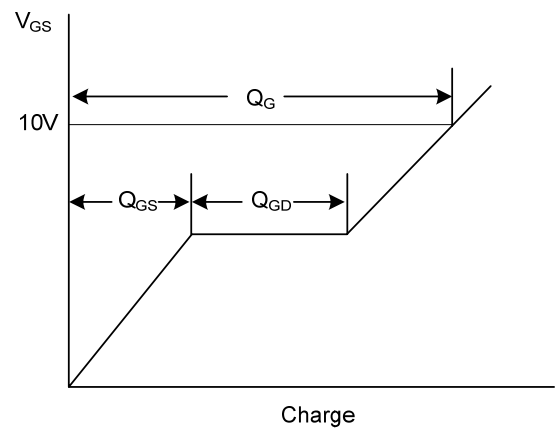
Switching Test Circuit



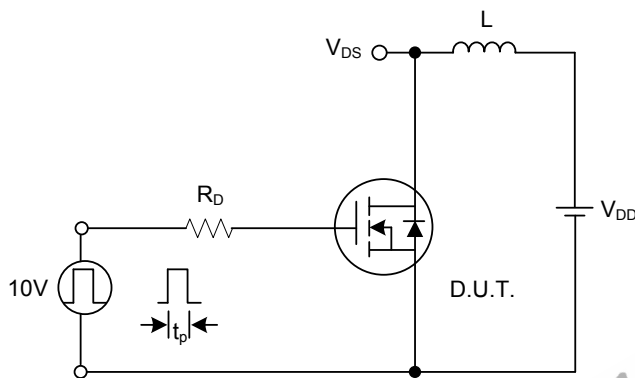
Switching Waveforms



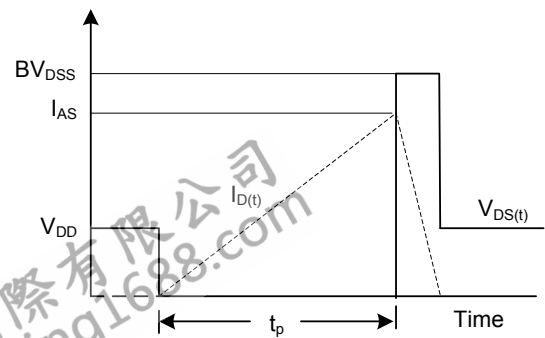
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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