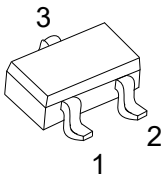
0.6A, 30V N-CHANNEL POWER MOSFET



SOT-23-3
(JEDEC TO-236)

■ DESCRIPTION

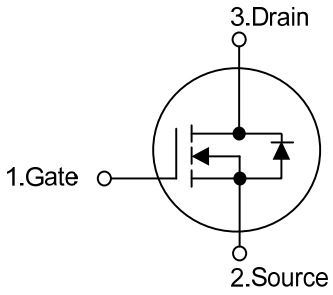
The UTC **UT06N03M** is a N-channel enhancement MOSFET using UTC's advanced technology to provide the customers with perfect $R_{DS(ON)}$ and high switching speed.

The UTC **UT06N03M** is suitable for all commercial-industrial applications at power dissipation levels to approximately 50 watts, etc.

■ FEATURES

* $R_{DS(ON)} \leq 580\ m\Omega$ @ V_{GS}=10V, I_D=300mA
* $R_{DS(ON)} \leq 900\ m\Omega$ @ V_{GS}=4.5V, I_D=300mA
* High Switching Speed

■ SYMBOL



■ ORDERING INFORMATION

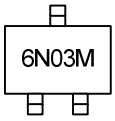
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT06N03ML-AE2-R	UT06N03MG-AE2-R	SOT-23-3	G	S	D	Tape Reel

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

UT06N03MG-AE2-R

(1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) AE2: SOT-23-3
(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	Continuous	I_D	0.6	A
	Pulsed	I_{DM}	1.2	A
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2	V/ns
Power Dissipation		P_D	0.3	W
Junction Temperature		T_J	+150	°C
Storage Temperature Range		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.
3. I_{SD} ≤ 0.6A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	416	°C/W
Junction to Case	θ_{JC}	250	°C/W

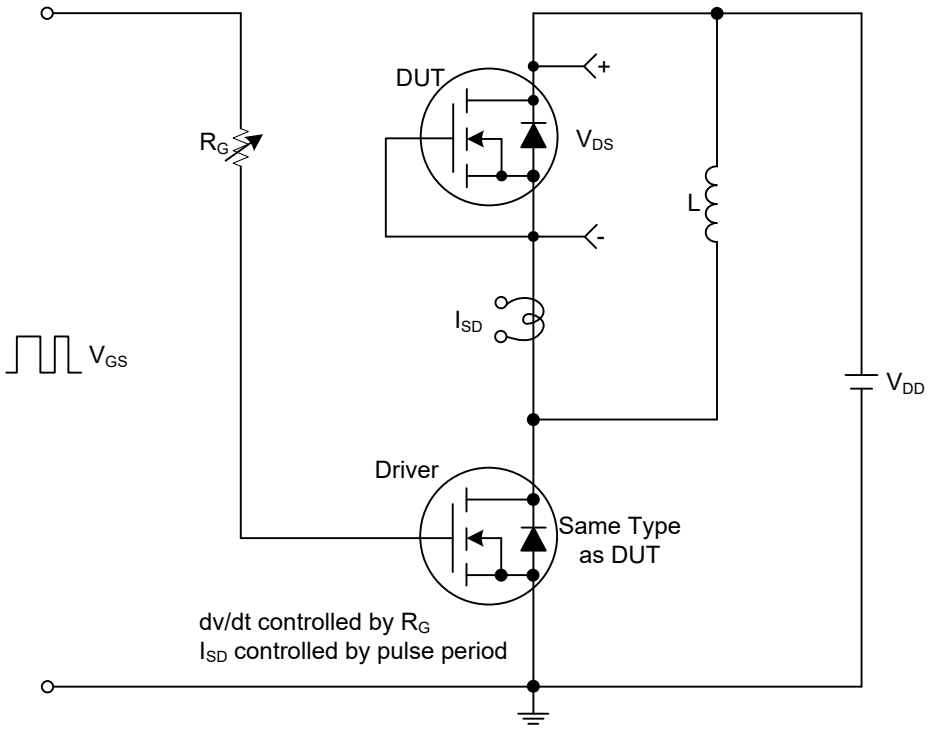
Note: Device mounted on FR4 substrate P_C board, 2oz copper, with 1inch square copper plate.

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

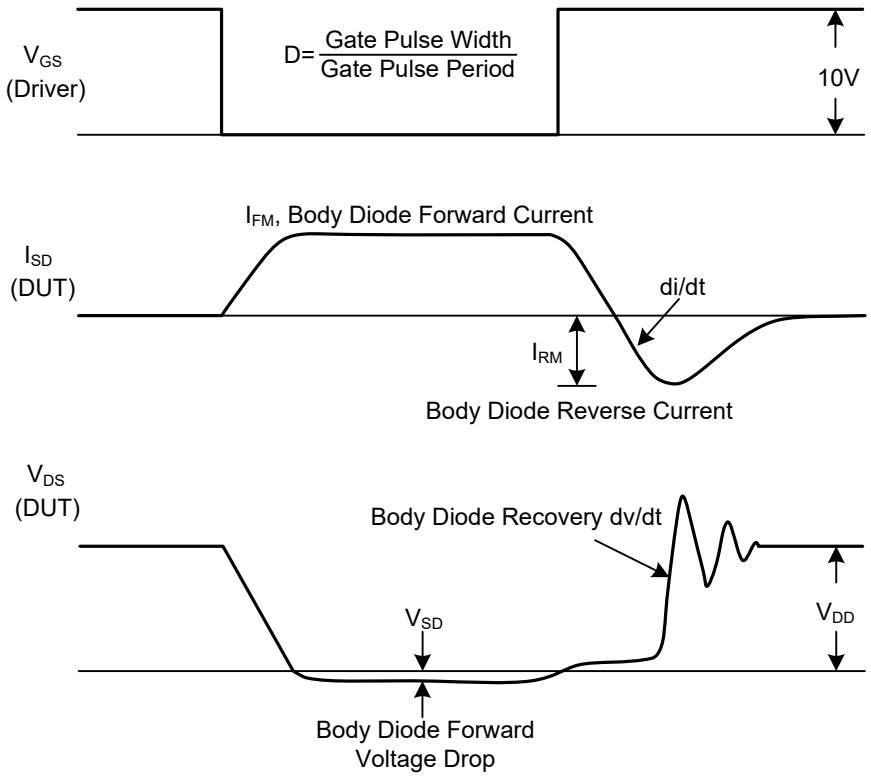
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	30			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=30V,V_{GS}=0V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	1.0		3.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=300mA			580	mΩ
			V_{GS}=4.5V, I_D=300mA			900	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{DS}=15V, V_{GS}=0V, f=1MHz		23.5		pF
Output Capacitance		C_{OSS}			12.4		pF
Reverse Transfer Capacitance		C_{RSS}			6.3		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{DS}=24V, V_{GS}=10V, I_D=0.6A (Note 1, 2)		8.4		nC
Gate to Source Charge		Q_{GS}			1.3		nC
Gate to Drain Charge		Q_{GD}			1.1		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DD}=15V, V_{GS}=10V, I_D=0.6A, R_G=3Ω (Note 1, 2)		1		ns
Rise Time		t_R			16.8		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			2.6		ns
Fall Time		t_F			27.2		ns
SOURCE DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body Diode Continuous Current		I_S				0.6	A
Maximum Body Diode Pulsed Current		I_{SM}				1.2	A
Drain-Source Diode Forward Voltage		V_{SD}	I_S=0.6A, V_{GS}=0V			1.4	V
Reverse Recovery Time		t_{rr}	I_S=0.6A, V_{GS}=0V		107		ns
Reverse Recovery Charge (Note 1)		Q_{rr}	dI_S/dt=100A/μs		70		nC

Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS



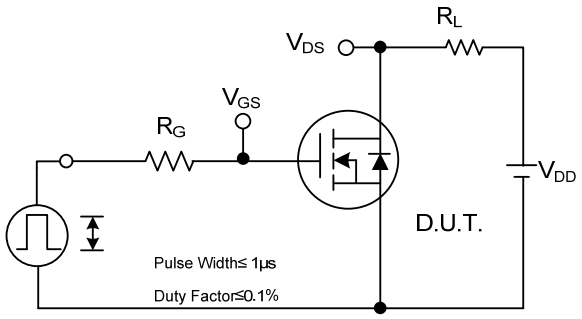
Peak Diode Recovery dv/dt Test Circuit



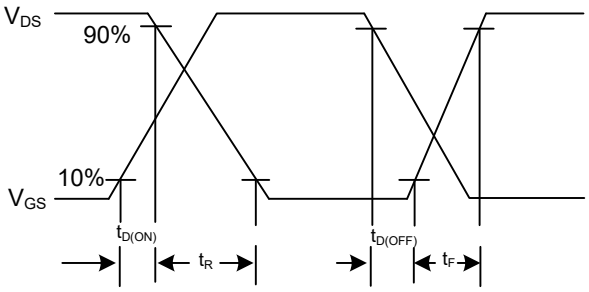
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

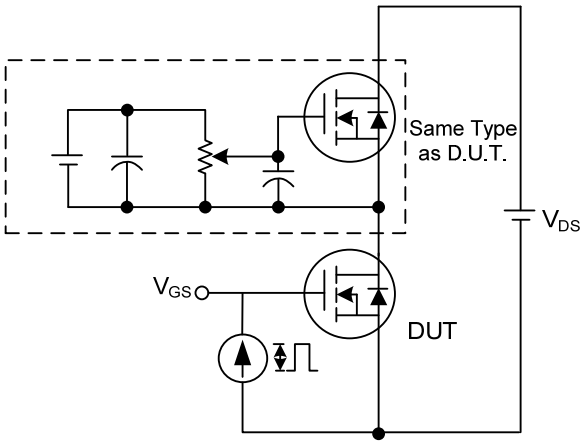
■ TEST CIRCUITS AND WAVEFORMS



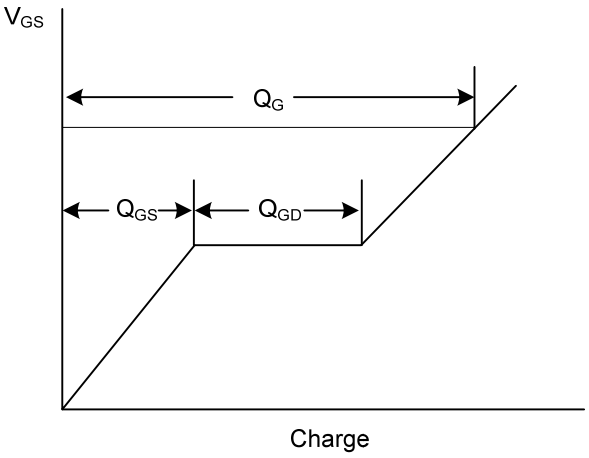
Switching Test Circuit



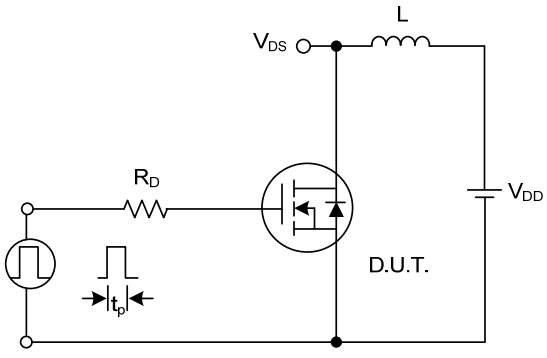
Switching Waveforms



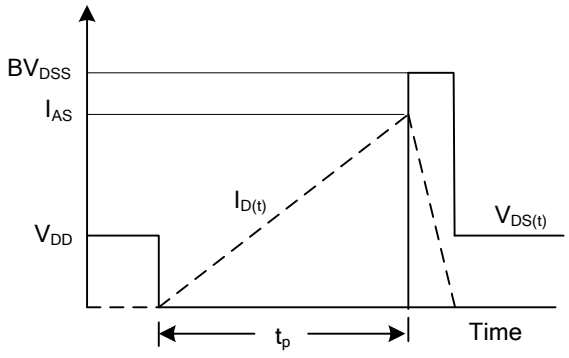
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms