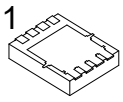
-100A, -30V P-CHANNEL POWER MOSFET



PDFN5×6

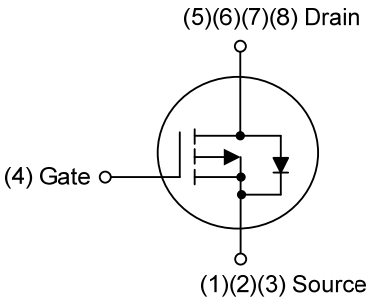
■ DESCRIPTION

The UTC **UT100P03M** provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

■ FEATURES

* $R_{DS(ON)} \leq$ 3.7 mΩ @ V_{GS}= -10V, I_D= -50A
* $R_{DS(ON)} \leq$ 5.7 mΩ @ V_{GS}= -4.5V, I_D= -20A
* 100% Avalanche Tested

■ SYMBOL



■ ORDERING INFORMATION

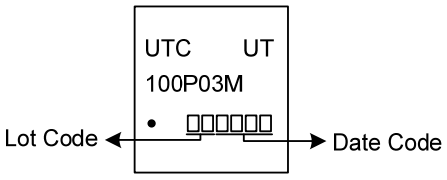
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT100P03ML-P5060-R	UT100P03MG-P5060-R	PDFN5×6	S	S	S	G	D	D	D	D	Tape Reel

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

UT100P03MG-P5060-R

(1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) P5060: PDFN5×6
(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	-100	A
	Pulsed (Note 2)	I_{DM}	-200	A
Avalanche Energy	Repetitive (Note 3)	E_{AS}	270	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	0.3	V/ns
Power Dissipation (T_C=25°C)		P_D	110	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.
3. L = 0.1mH, I_{AS} = -73.5A, V_{DD} = -50V, R_G = 25Ω, Starting T_J = 25°C
4. I_{SD} ≤ -30A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	65	°C/W
Junction to Case	θ_{JC}	1.13	°C/W

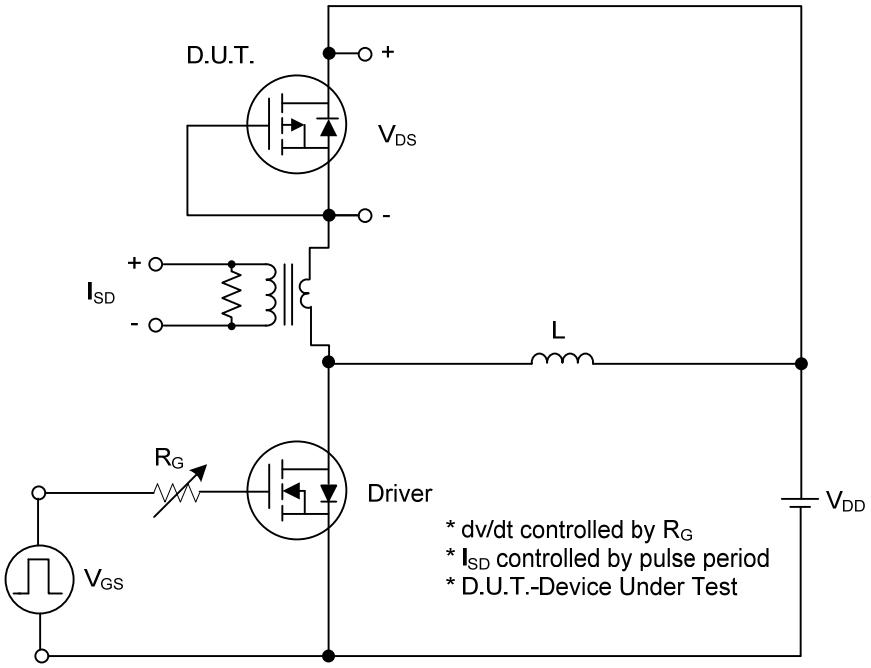
Note: Device mounted on FR-4 substrate P_C board, 2oz copper, with 1inch square copper plate.

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

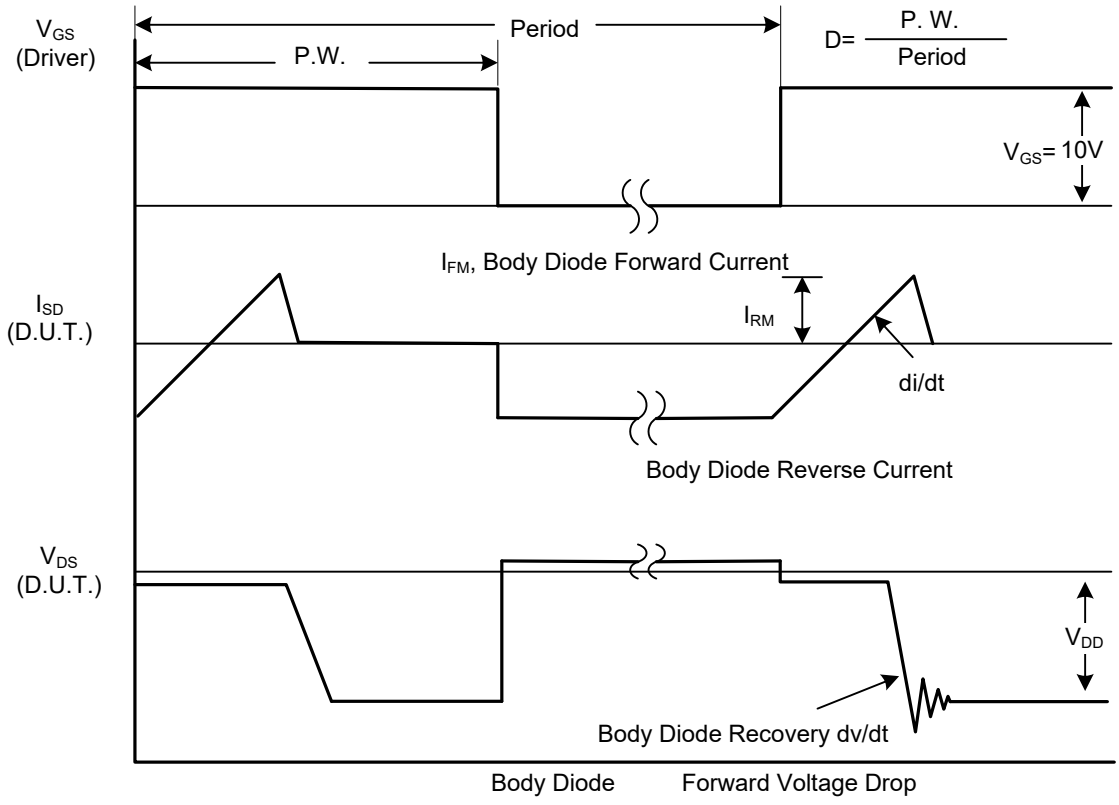
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=-250μA, V_{GS}=0V	-30			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=-30V, V_{GS}=0V			-1	μA
Gate- Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			+100	nA
	Reverse		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=-50A			3.7	mΩ
			V_{GS}=-4.5V, I_D=-20A			5.7	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{DS}=-25V, V_{GS}=0V, f=1MHz		8475		pF
Output Capacitance		C_{OSS}			1350		pF
Reverse Transfer Capacitance		C_{RSS}			816		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q_G	V_{DS}=-24V, V_{GS}=-10V, I_D=-100A (Note 1, 2)		225		nC
Gate to Source Charge		Q_{GS}			29		nC
Gate to Drain Charge		Q_{GD}			72		nC
Turn-ON Delay Time (Note 1)		$t_{D(ON)}$	V_{DS}=-15V, V_{GS}=-10V, I_D=-100A R_G=3Ω (Note 1, 2)		73		ns
Rise Time		t_R			131		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			1001		ns
Fall-Time		t_F			575		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				-100	A
Drain-Source Diode Forward Voltage		V_{SD}	I_S=-100A, V_{GS}=0V (Note 2)			-1.4	V
Body Diode Reverse Recovery Time (Note 1)		t_{rr}	I_S=-30A, V_{GS}=0V, dI_F/dt=100A/μs		250		ns
Body Diode Reverse Recovery Charge		Q_{rr}			1324		nC

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

■ TEST CIRCUITS AND WAVEFORMS

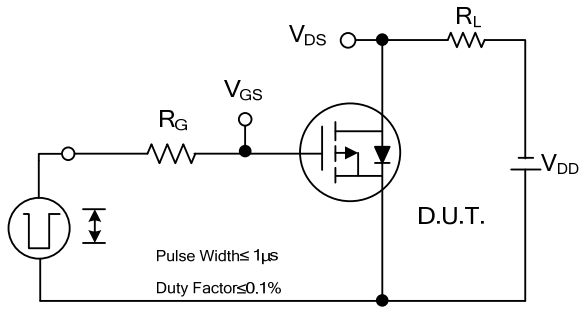


Peak Diode Recovery dv/dt Test Circuit

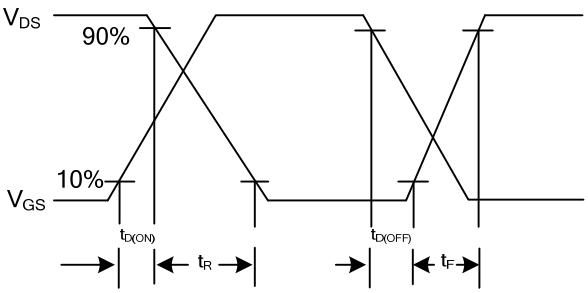


Peak Diode Recovery dv/dt Waveforms

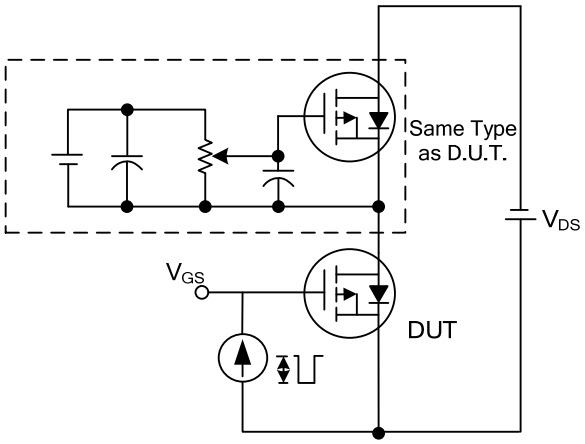
■ TEST CIRCUITS AND WAVEFORMS



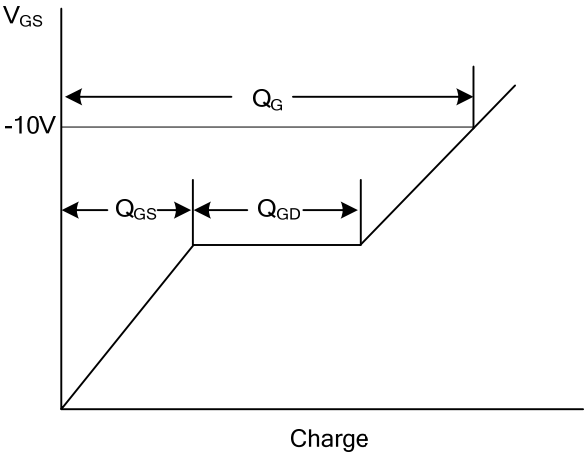
Switching Test Circuit



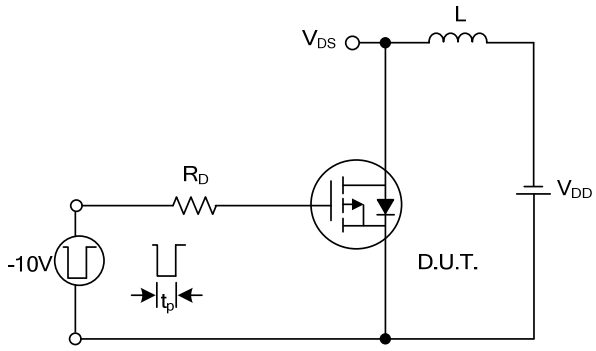
Switching Waveforms



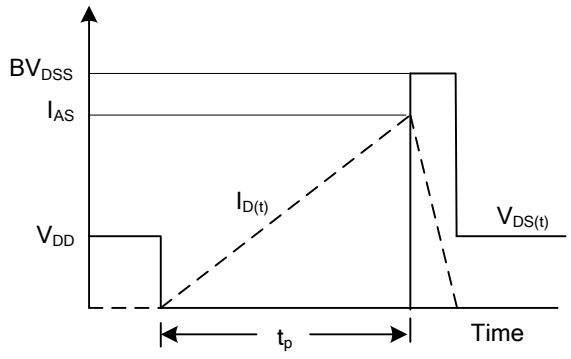
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms