

## UT100P03M

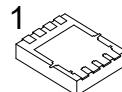
Preliminary

Power MOSFET

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

## ■ 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.

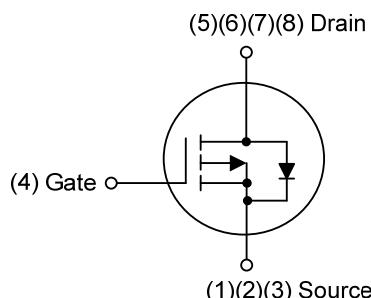


PDFN5x6

## ■ FEATURES

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

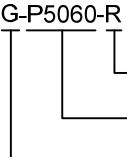
## ■ SYMBOL



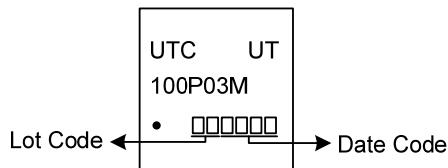
## ■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT100P03ML-P5060-R	UT100P03MG-P5060-R	PDFN5x6	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 (2)Package Type (3)Green Package	(1) R: Tape Reel (2) P5060: PDFN5x6 (3) G: Halogen Free and Lead Free, L: Lead Free
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## ■ MARKING



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

PARAMETER		SYMBOL	RATINGS		UNIT
Drain-Source Voltage		$V_{DSS}$	-30		V
Gate-Source Voltage		$V_{GSS}$	±20		V
Drain Current	Continuous, Pulsed (Note 2)	$I_D$ $I_{DM}$	-100 -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 ( $T_c=25^\circ\text{C}$ )		$P_D$	110		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.

3.  $L = 0.1\text{mH}$ ,  $I_{AS} = -73.5\text{A}$ ,  $V_{DD} = -50\text{V}$ ,  $R_G = 25\Omega$ , Starting  $T_J = 25^\circ\text{C}$

4.  $I_{SD} \leq -30\text{A}$ ,  $di/dt \leq 200\text{A}/\mu\text{s}$ ,  $V_{DD} \leq BV_{DSS}$ , Starting  $T_J = 25^\circ\text{C}$

## ■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS		UNIT
Junction to Ambient		$\theta_{JA}$	65		$^\circ\text{C}/\text{W}$
Junction to Case		$\theta_{JC}$	1.13		$^\circ\text{C}/\text{W}$

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

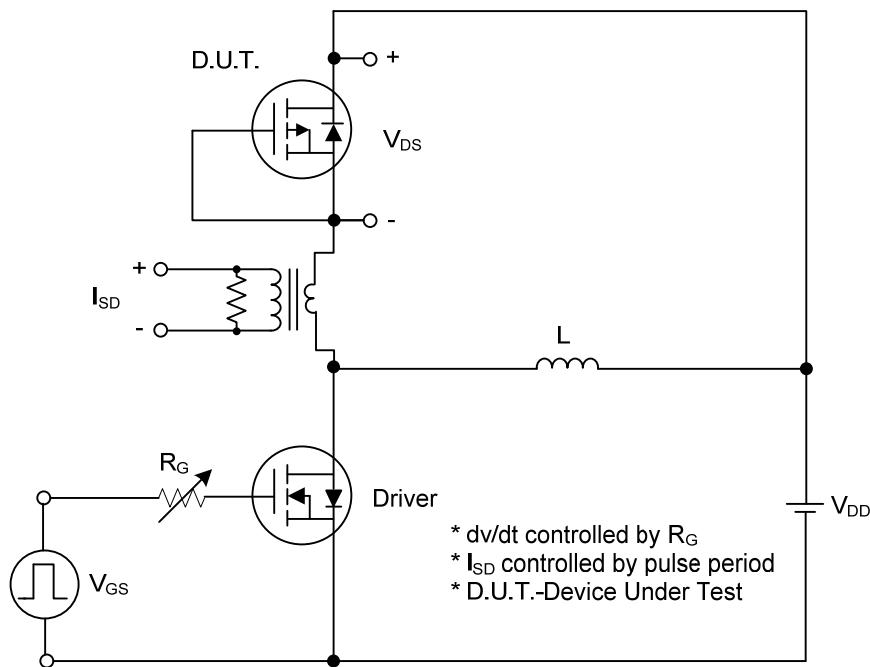
■ ELECTRICAL CHARACTERISTICS ( $T_J=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=-250\mu\text{A}$ , $V_{GS}=0\text{V}$	-30			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-30\text{V}$ , $V_{GS}=0\text{V}$		-1		$\mu\text{A}$
Gate- Source Leakage Current	Forward Reverse	$I_{GS}=-20\text{V}$ , $V_{DS}=0\text{V}$ $V_{GS}=-20\text{V}$ , $V_{DS}=0\text{V}$		+100 -100		nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$ , $I_D=-250\mu\text{A}$	-1.0		-3.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10\text{V}$ , $I_D=-50\text{A}$ $V_{GS}=-4.5\text{V}$ , $I_D=-20\text{A}$		3.7 5.7		$\text{m}\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=-25\text{V}$ , $V_{GS}=0\text{V}$ , $f=1\text{MHz}$		8475		pF
Output Capacitance	$C_{OSS}$			1350		pF
Reverse Transfer Capacitance	$C_{RSS}$			816		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge (Note 1)	$Q_G$	$V_{DS}=-24\text{V}$ , $V_{GS}=-10\text{V}$ , $I_D=-100\text{A}$ (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)	$t_{D(ON)}$	$V_{DS}=-15\text{V}$ , $V_{GS}=-10\text{V}$ , $I_D=-100\text{A}$ $R_G=3\Omega$ (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
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Continuous Current	$I_S$				-100	A
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_S=-100\text{A}$ , $V_{GS}=0\text{V}$ (Note 2)			-1.4	V
Body Diode Reverse Recovery Time (Note 1)	$t_{rr}$	$I_S=-30\text{A}$ , $V_{GS}=0\text{V}$ , $dl/I/dt=100\text{A}/\mu\text{s}$		250		ns
Body Diode Reverse Recovery Charge	$Q_{rr}$			1324		nC

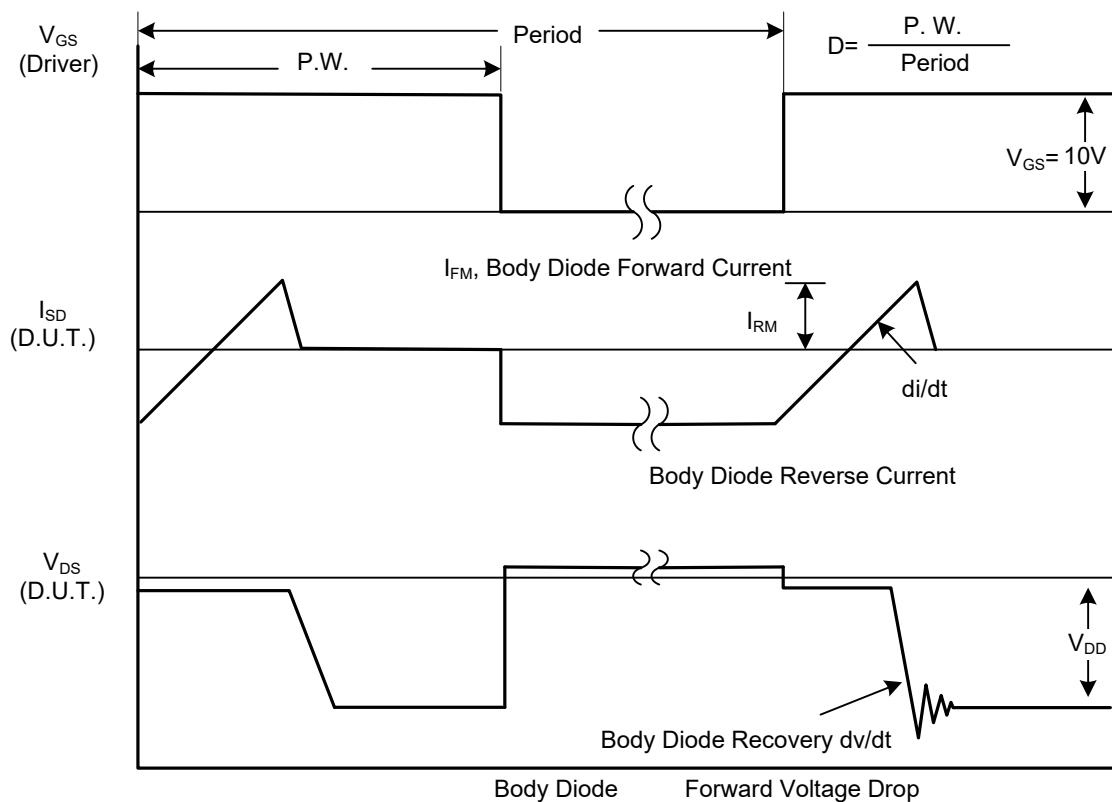
Notes: 1. Pulse Test: Pulse width  $\leq 300\mu\text{s}$ , Duty cycle  $\leq 2\%$ .

2. Essentially independent of operating ambient temperature.

## ■ TEST CIRCUITS AND WAVEFORMS

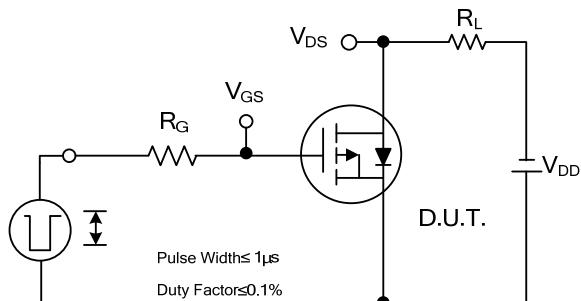


## Peak Diode Recovery dv/dt Test Circuit

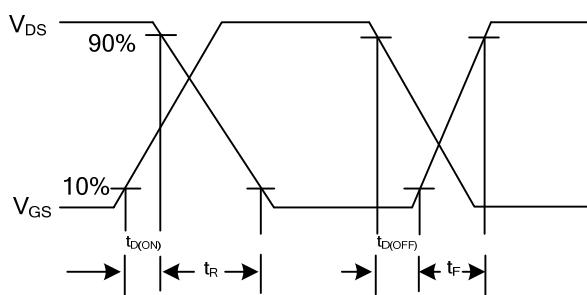


## Peak Diode Recovery dv/dt Waveforms

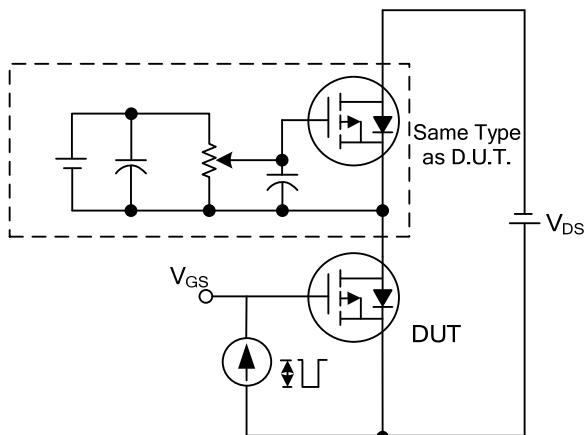
## ■ TEST CIRCUITS AND WAVEFORMS



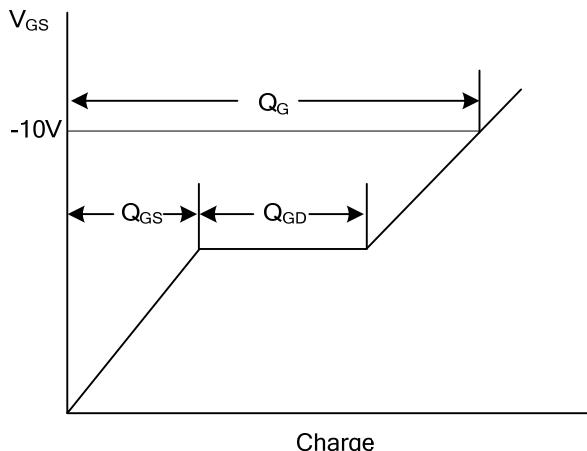
Switching Test Circuit



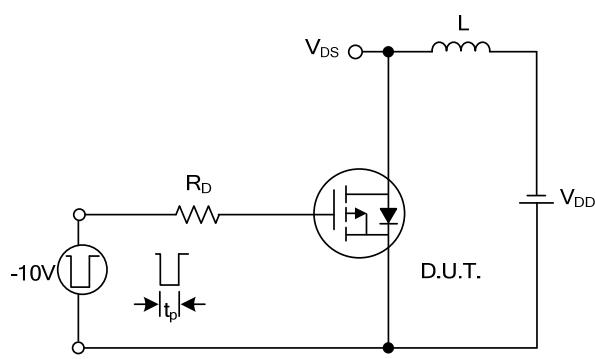
Switching Waveforms



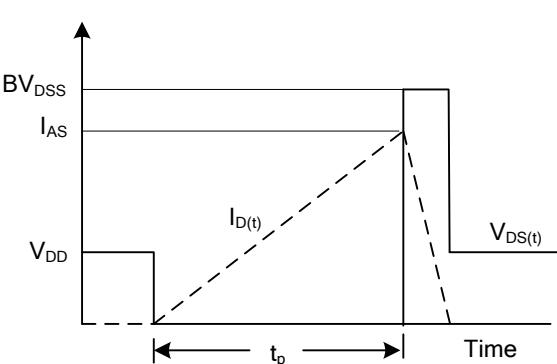
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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