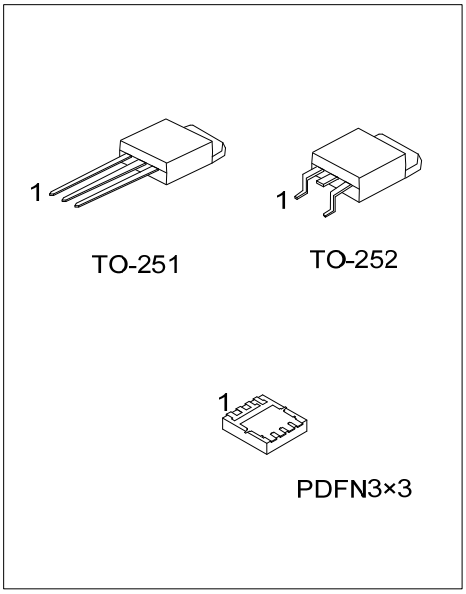
UT40N03

Power MOSFET

40 Amps, 30 Volts
N-CHANNEL POWER MOSFET



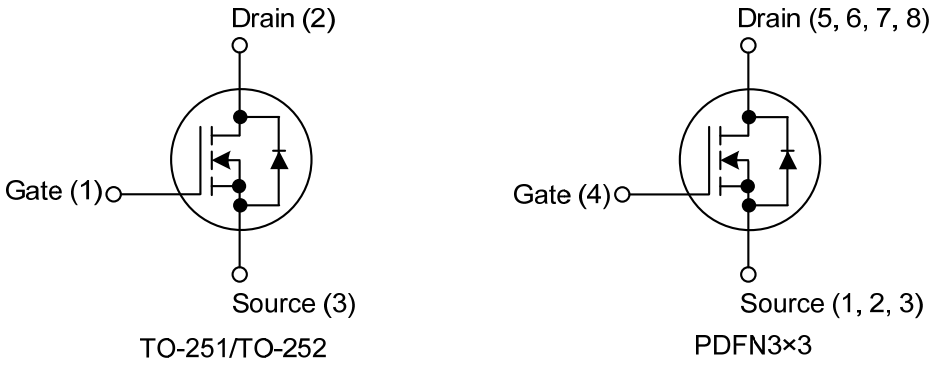
■ DESCRIPTION

The **UT40N03** power MOSFET provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness

■ FEATURES

* $R_{DS(ON)}$ ≤ 17 mΩ @ V_{GS}=10V, I_D=20A
* Low capacitance
* Optimized gate charge
* Fast switching capability
* Avalanche energy specified

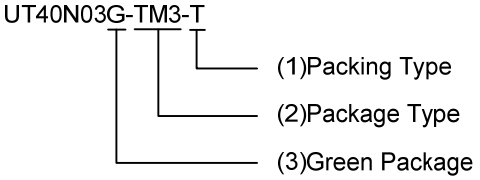
■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT40N03L-TM3-T	UT40N03G-TM3-T	TO-251	G	D	S	-	-	-	-	-	Tube
UT40N03L-TN3-R	UT40N03G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UT40N03L-P3030-R	UT40N03G-P3030-R	PDFN3×3	S	S	S	G	D	D	D	D	Tape Reel

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

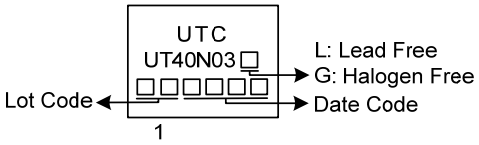
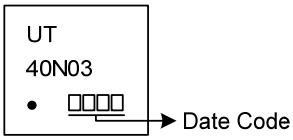


(1) T: Tube, R: Tape Reel

(2) TM3: TO-251, TN3: TO-252, P3030: PDFN3×3

(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

TO-251 / TO-252	PDFN3×3
	

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current		I_D	40	A
Pulsed Drain Current (Note 1)		I_{DM}	80	A
Total Power Dissipation	TO-251/TO-252	P_D	48	W
	PDFN3×3		20	W
Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-55 ~ +150	°C

Note: 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.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-251/TO-252	θ_{JA}	50	°C/W
	PDFN3×3		65	°C/W
Junction to Case	TO-251/TO-252	θ_{JC}	2.6	°C/W
	PDFN3×3		6.25	°C/W

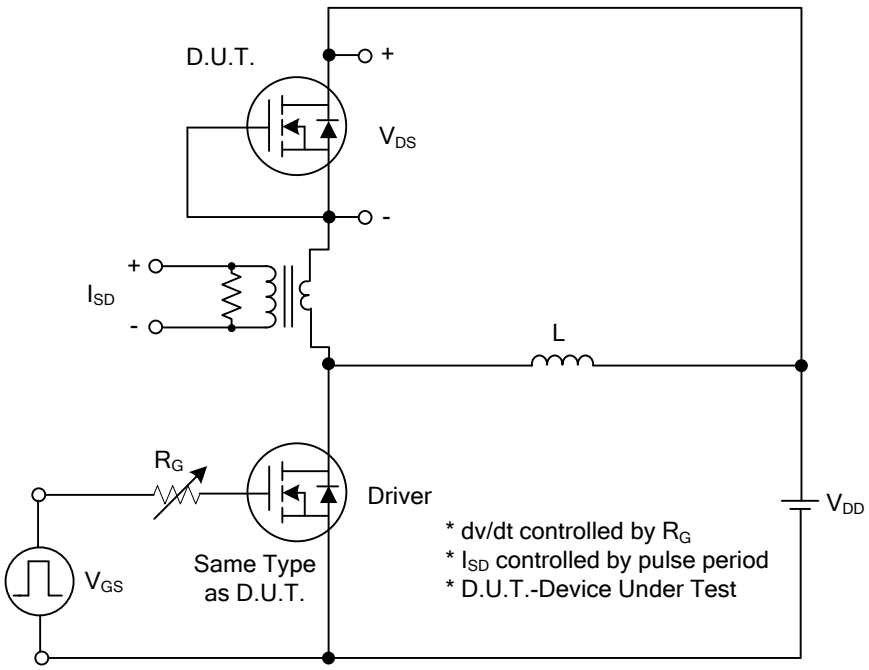
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

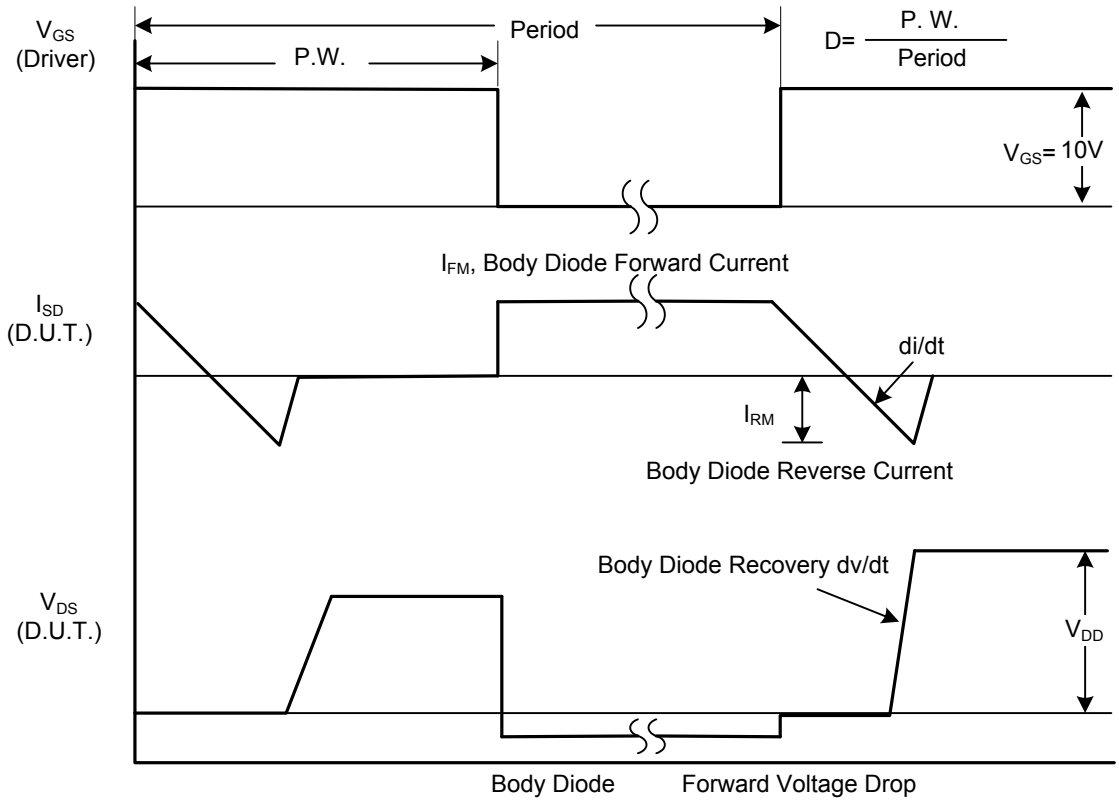
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0 V, I_D =250 μA	30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS} =30 V, V_{GS} =0 V, T_J=25℃			1	μA
Gate- Source Leakage Current	I_{GSS}	V_{GS} = ±20V			±100	nA
ON CHARACTERISTICS						
Gate-Threshold Voltage	$V_{GS(TH)}$	V_{DS} =V_{GS}, I_D =250 μA	1		3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS} =10 V, I_D =20 A		14	17	mΩ
		V_{GS}=4.5 V, I_D =16 A		20	23	
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS} =25 V, V_{GS} =0V, f=1.0MHz		600		pF
Output Capacitance	C_{OSS}			145		
Reverse Transfer Capacitance	C_{RSS}			125		
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DS} =15V, V_{GS}=10V, I_D=20A		24		nC
Gate-Source Charge	Q_{GS}			3		
Gate-Drain Charge	Q_{GD}			6		
Turn-ON Delay Time	$t_{D(ON)}$	V_{DS} =15 V, V_{GS} =10V, I_D=1.0A, R_G =3.3 Ω, R_L =0.75 Ω		14		ns
Turn-ON Rise Time	t_R			18		
Turn-OFF Delay Time	$t_{D(OFF)}$			32		
Turn-OFF Fall-Time	t_F			28		
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				40	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				80	
Drain-Source Diode Forward Voltage	V_{SD}	T_J=25℃, I_S=40A, V_{GS}=0V			1.3	V

Notes: 1. Repetitive rating; pulse width limited by max. junction temperature.
2. Pulse width ≤ 300us, duty cycle ≤ 2%.

■ TEST CIRCUITS AND WAVEFORMS

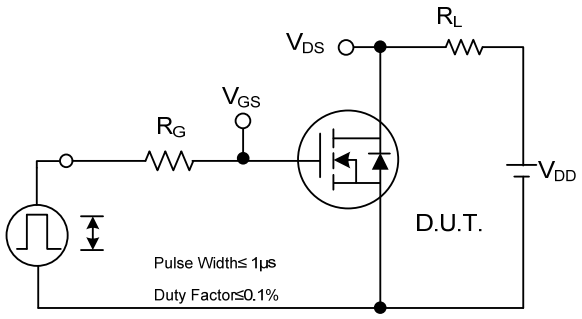


Peak Diode Recovery dv/dt Test Circuit

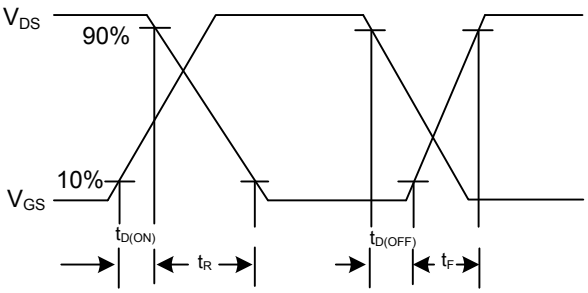


Peak Diode Recovery dv/dt Waveforms

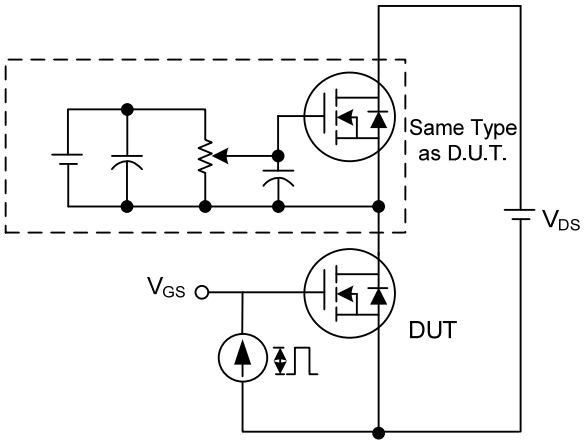
■ TEST CIRCUITS AND WAVEFORMS



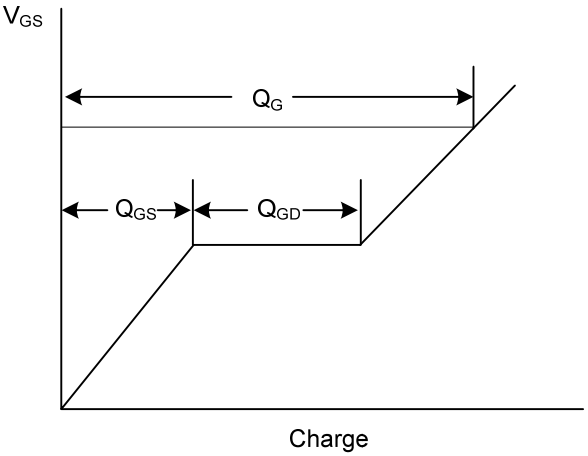
Switching Test Circuit



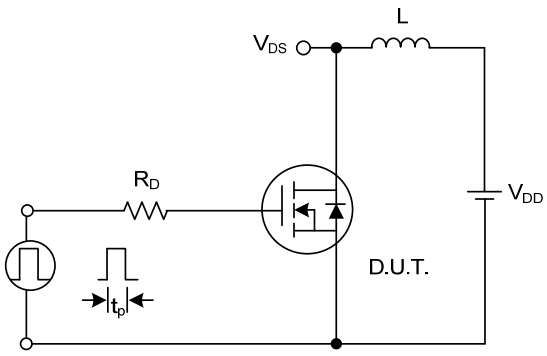
Switching Waveforms



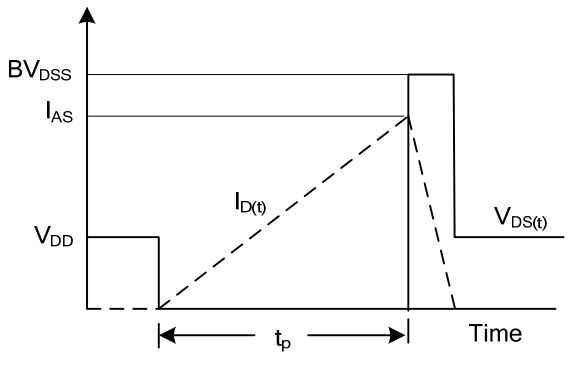
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms