



UT136N03

Preliminary

Power MOSFET

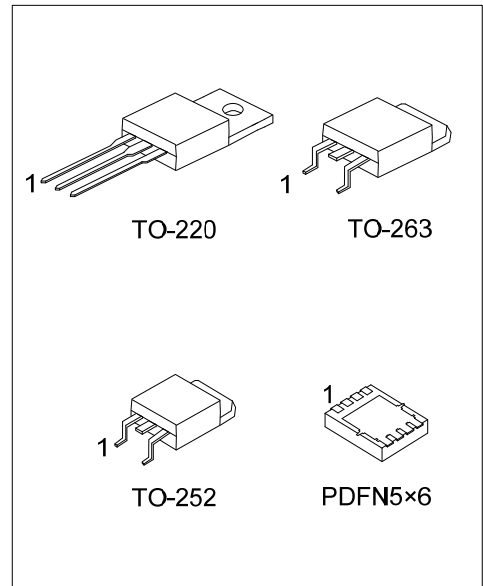
136A, 30V N-CHANNEL ENHANCEMENT MODE

DESCRIPTION

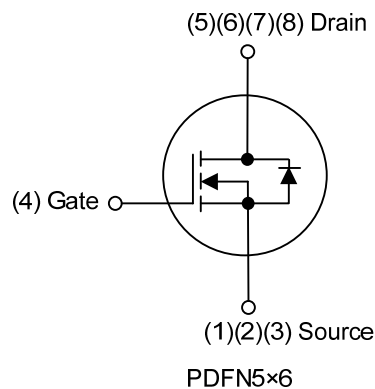
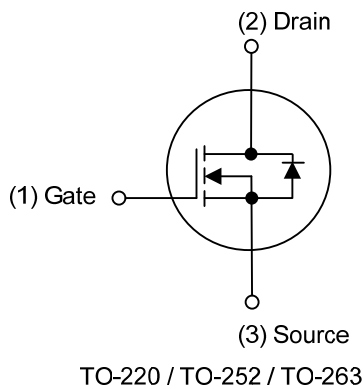
The UT136N03 uses advanced trench technology to provide excellent R_{DS(ON)}, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

FEATURES

- * R_{DS(ON)} ≤ 3.0 mΩ @ V_{GS}=10V, I_D=40A
- R_{DS(ON)} ≤ 4.0 mΩ @ V_{GS}=4.5V, I_D=40A



SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT136N03L-TA3-R	UT136N03G-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UT136N03L-TN3-R	UT136N03G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UT136N03L-TQ2-T	UT136N03G-TQ2-T	TO-263	G	D	S	-	-	-	-	-	Tube
UT136N03L-TQ2-R	UT136N03G-TQ2-R	TO-263	G	D	S	-	-	-	-	-	Tape Reel
UT136N03L-P5060-R	UT136N03G-P5080-R	PDFN5×6	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT136N03G-TA3-T</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TN3: TO-252, TQ2: TO-263 P5060: PDFN5×6 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING

TO-220 / TO-252 / TO-263	PDFN5×6
<p>UTC UT136N03 □ □ □ □ □ □ 1</p> <p>Lot Code ← → Date Code</p> <p>L: Lead Free G: Halogen Free</p>	<p>UTC UT 136N03 • □ □ □ □ □</p> <p>Lot Code ← → Date Code</p>

■ 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
Continuous Drain Current		I _D	136	A
Pulsed Drain Current (Note 1)		I _{DM}	400	A
Single Pulsed Avalanche Energy (Note 3)		E _{AS}	320	mJ
Power Dissipation	TO-220	P _D	100	W
	TO-263			
	TO-252			
	PDFN5×6			
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}=80A, V_{DD}=25V, R_G=25Ω, Starting T_J = 25°C.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ _{JA}	62.5	°C/W
	TO-263			
	TO-252			
	PDFN5×6			
Junction to Case (Note)	TO-220	θ _{JC}	1.4	°C/W
	TO-263			
	TO-252			
	PDFN5×6			
			2.23 (Note)	°C/W
			1.67 (Note)	°C/W

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

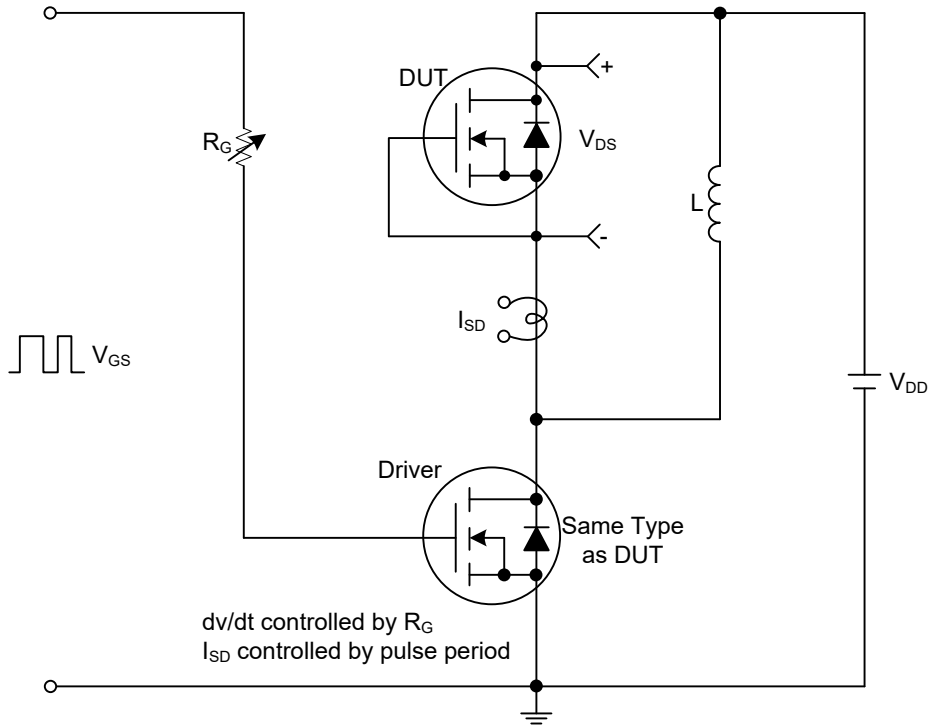
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	30			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
ON CHARACTERISTICS (Note2)						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1.0		3.0	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =40A			3.0	mΩ
		V _{GS} =4.5V, I _D =40A			4.0	mΩ
DYNAMIC PARAMETERS (Note3)						
Input Capacitance	C _{ISS}	V _{DS} =15V, V _{GS} =0V, f=1.0MHz		4820		pF
Output Capacitance	C _{OSS}			1220		pF
Reverse Transfer Capacitance	C _{RSS}			940		pF
SWITCHING PARAMETERS (Note3)						
Total Gate Charge	Q _G	V _{DS} =24V, V _{GS} =4.5V, I _D =136A, I _G =1.0mA (Note 1, 2)		70		nC
Gate Source Charge	Q _{GS}			22		nC
Gate Drain Charge	Q _{GD}			40		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =15V, V _{GS} =10V, I _D =136A, R _G =3Ω (Note 1, 2)		13		ns
Turn-ON Rise Time	t _R			20		ns
Turn-OFF Delay Time	t _{D(OFF)}			102		ns
Turn-OFF Fall-Time	t _F			70		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V			1.5	V

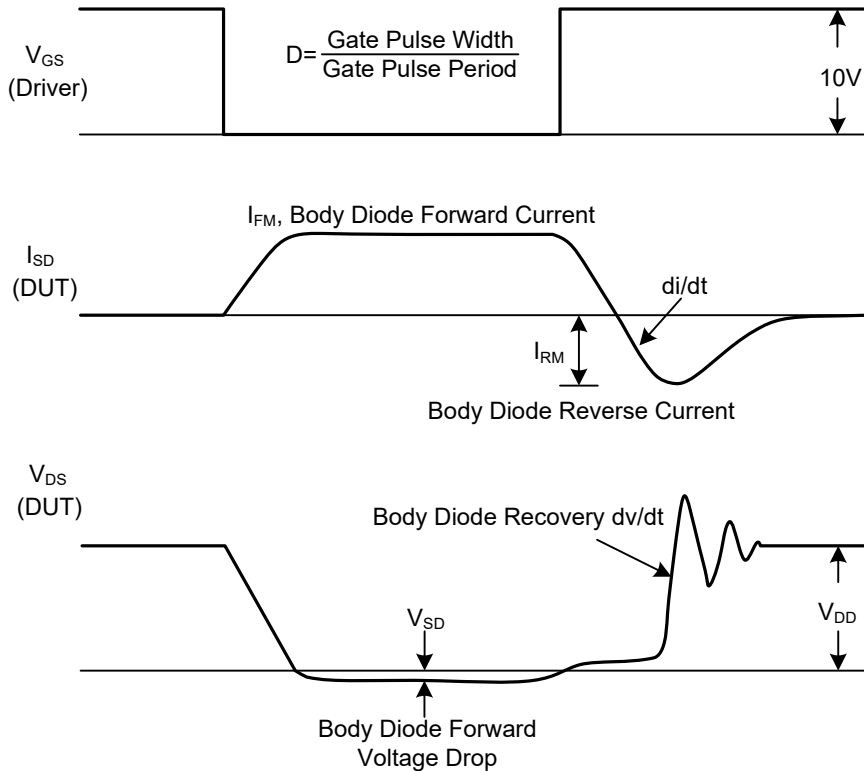
Notes: 1. Pulse width limited by maximum junction temperature.

2. Pulse Test: Pulse Width < 300μs, Duty Cycle < 2%.

■ TEST CIRCUITS AND WAVEFORMS



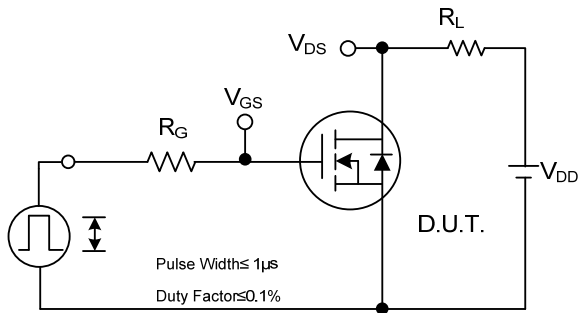
Peak Diode Recovery dv/dt Test Circuit



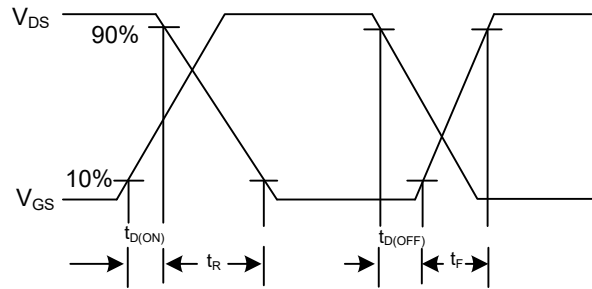
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

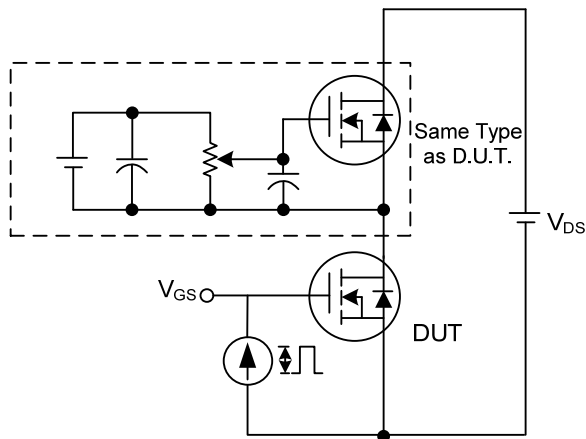
■ TEST CIRCUITS AND WAVEFORMS



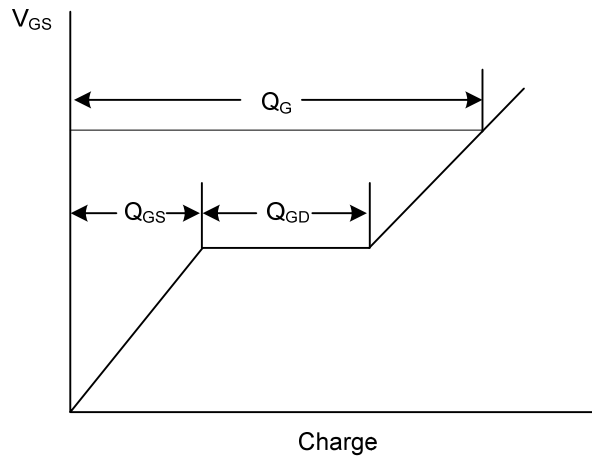
Switching Test Circuit



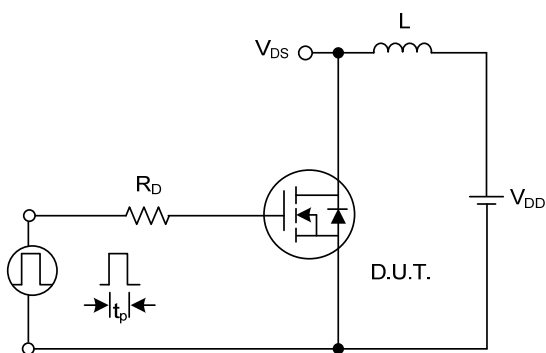
Switching Waveforms



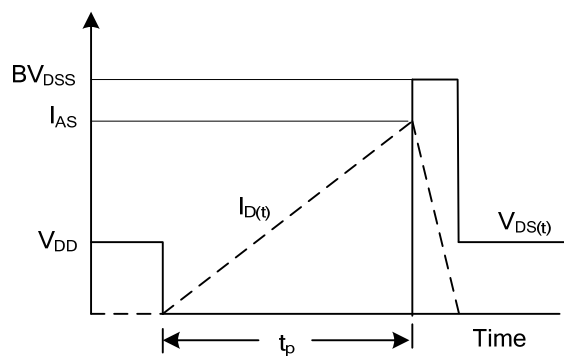
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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