



UT2NN03V

Preliminary

Power MOSFET

2.0A, 30V N-CHANNEL ENHANCEMENT MODE

DESCRIPTION

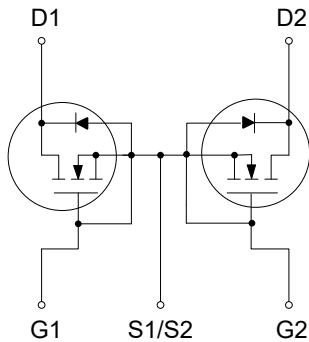
The UTC **UT2NN03V** is N-channel enhancement mode Power MOSFET, designed in serried ranks with fast switching speed, low on-resistance and favorable stabilization.

Used in commercial and industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

FEATURES

- * $R_{DS(ON)} \leq 96 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=1.9\text{A}$
- $R_{DS(ON)} \leq 115 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=1.6\text{A}$
- $R_{DS(ON)} \leq 150 \text{ m}\Omega$ @ $V_{GS}=2.5\text{V}$, $I_D=1.2\text{A}$
- * Fast switching capability
- * Avalanche energy tested
- * Improved dv/dt capability, high ruggedness

SYMBOL

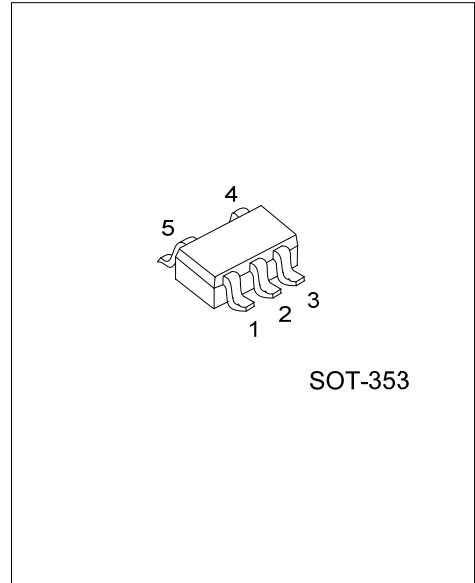


ORDERING INFORMATION

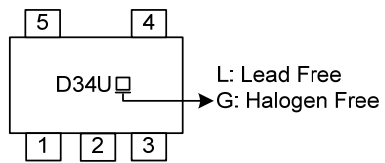
Ordering Number		Package	Pin Assignment					Packing
Lead Free	Halogen Free		1	2	3	4	5	
UT2NN03VL-AL5-R	UT2NN03VG-AL5-R	SOT-353	G1	S1/S2	G2	D2	D1	Tape Reel

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

UT2NN03VG-AL5-R		(1) Packing Type	(1) R: Tape Reel
		(2) Package Type	(2) AL5: SOT-353
		(3) Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free



■ MARKING



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

PARAMETER	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current (Note 3)	I_D	2	A
Pulsed Drain Current (Note 1, 2)	I_{DM}	8	A
Total Power Dissipation ($T_A = 25^\circ\text{C}$)	P_D	0.2	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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient (Note)	θ_{JA}	625	$^\circ\text{C/W}$

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

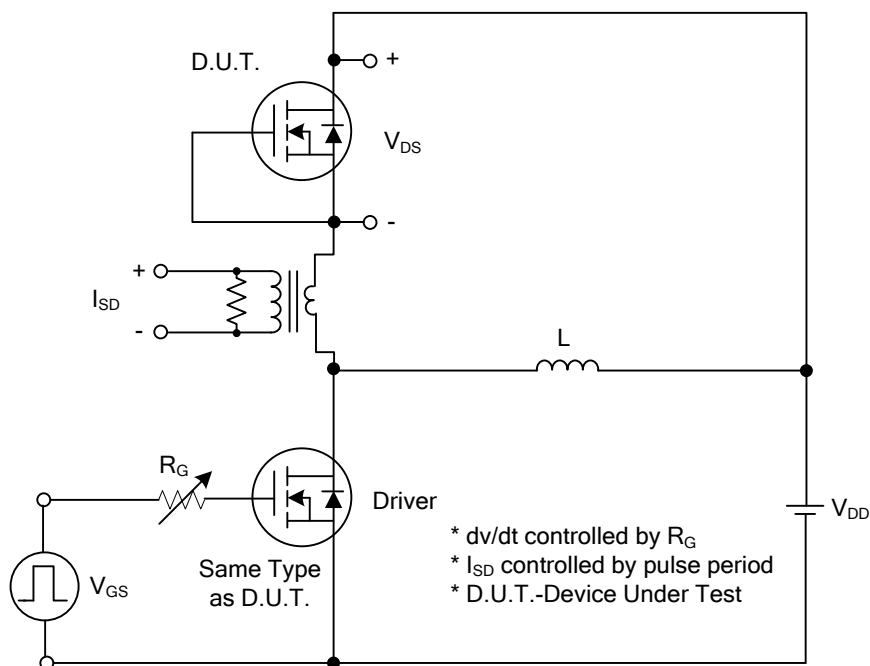
■ ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	30			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =24V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±12V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	0.6		1.8	V
Drain-Source On-State Resistance (Note 2)	R _{DS(ON)}	V _{GS} =10V, I _D =1.9A			96	mΩ
		V _{GS} =4.5V, I _D =1.6A			115	mΩ
		V _{GS} =2.5V, I _D =1.2A			150	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{ISS}	V _{DS} =15V, V _{GS} =0V, f=1.0MHz		152		pF
Output Capacitance	C _{OSS}			28		pF
Reverse Transfer Capacitance	C _{RSS}			21		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q _G	V _{DS} =24V, V _{GS} =4.5V, I _D =2.0A (Note 1,2)		7.2		nC
Gate-Source Charge	Q _{GS}			1.6		nC
Gate-Drain Charge	Q _{GD}			1.1		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =15V, V _{GS} =10V, I _D =2.0A, R _G =3Ω (Note 1,2)		3		ns
Turn-ON Rise Time	t _R			16		ns
Turn-OFF Delay Time	t _{D(OFF)}			19		ns
Turn-OFF Fall Time	t _F			18		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				2	A
Maximum Body-Diode Pulsed Current	I _{SM}				8	A
Drain-Source Diode Forward Voltage (Note 1)	V _{SD}	I _S =2.0A, V _{GS} =0V			1.2	V

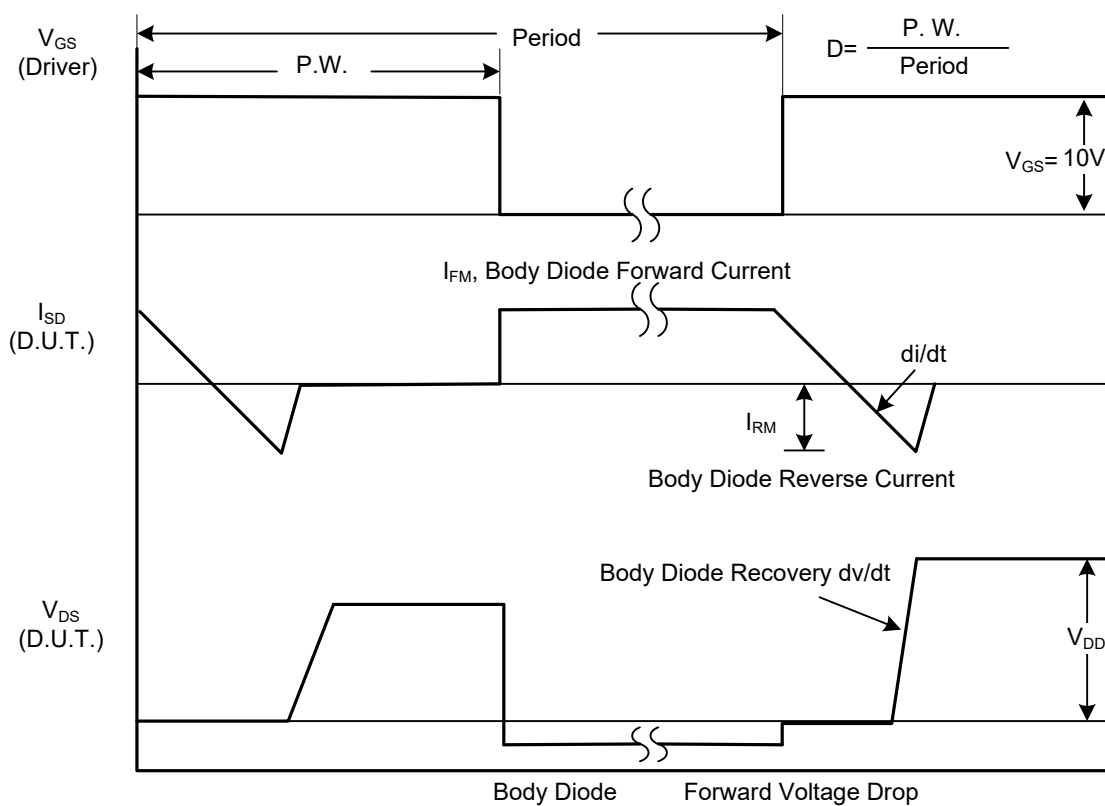
Notes: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

TEST CIRCUITS AND WAVEFORMS

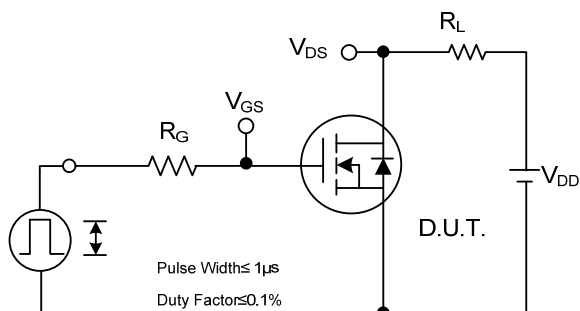


Peak Diode Recovery dv/dt Test Circuit

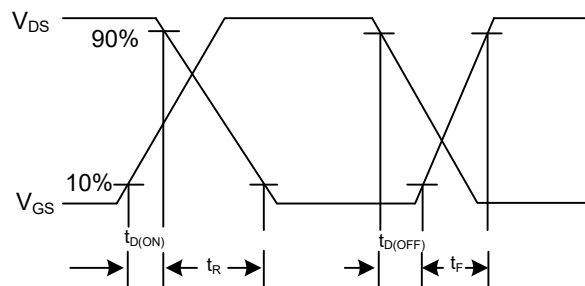


Peak Diode Recovery dv/dt Waveforms

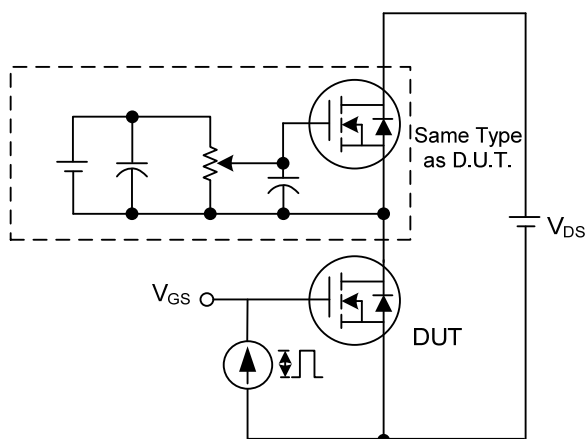
■ TEST CIRCUITS AND WAVEFORMS



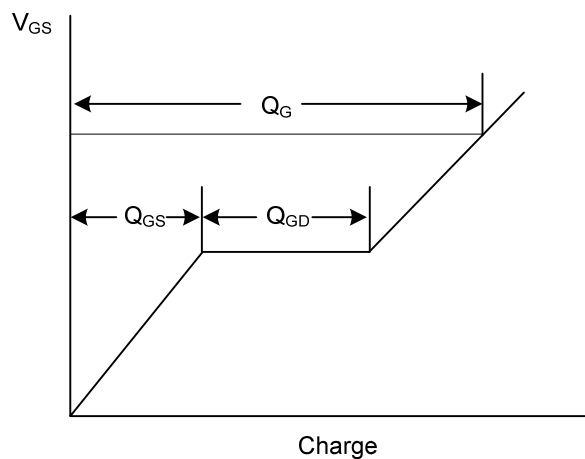
Switching Test Circuit



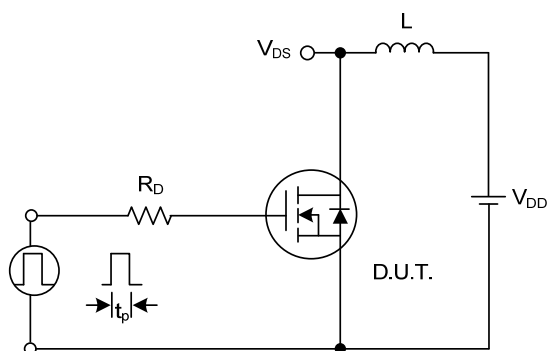
Switching Waveforms



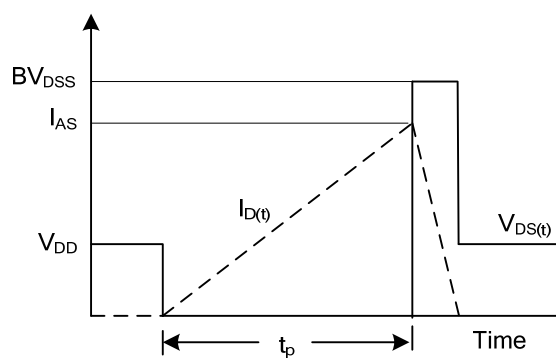
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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