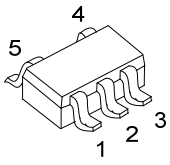
UT2NN03V

Preliminary ***Power MOSFET***

2A, 30V N-CHANNEL ENHANCEMENT MODE



SOT-353

■ DESCRIPTION

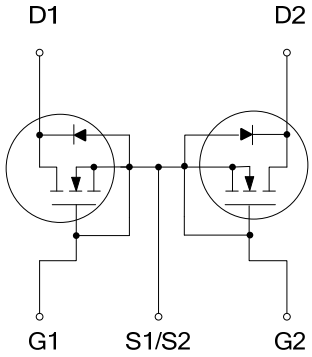
The UTC **UT2NN03V** is N-channel enhancement mode Power MOSFET, designed in serried ranks with fast switching speed, low on-resistance and favorable stabilization.

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

■ FEATURES

* $R_{DS(ON)}$ ≤ 96 mΩ @ V_{GS}=10V, I_D=1.9A
  $R_{DS(ON)}$ ≤ 105 mΩ @ V_{GS}=4.5V, I_D=1.6A
  $R_{DS(ON)}$ ≤ 128 mΩ @ V_{GS}=2.5V, I_D=1.2A
  $R_{DS(ON)}$ ≤ 180 mΩ @ V_{GS}=1.8V, I_D=0.7A
* Fast switching capability
* Avalanche energy tested
* Improved dv/dt capability, high ruggedness

■ SYMBOL



■ ORDERING INFORMATION

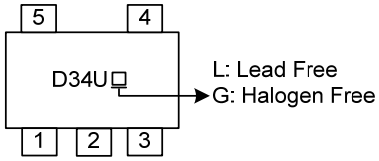
Ordering Number		Package	Pin Assignment					Packing
Lead Free	Halogen Free		1	2	3	4	5	
UT2NN03VL-AL5-R	UT2NN03VG-AL5-R	SOT-353	G1	S1/S2	G2	D2	D1	Tape Reel

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°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°C)	P_D	0.2	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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient (Note)	θ_{JA}	625	°C/W

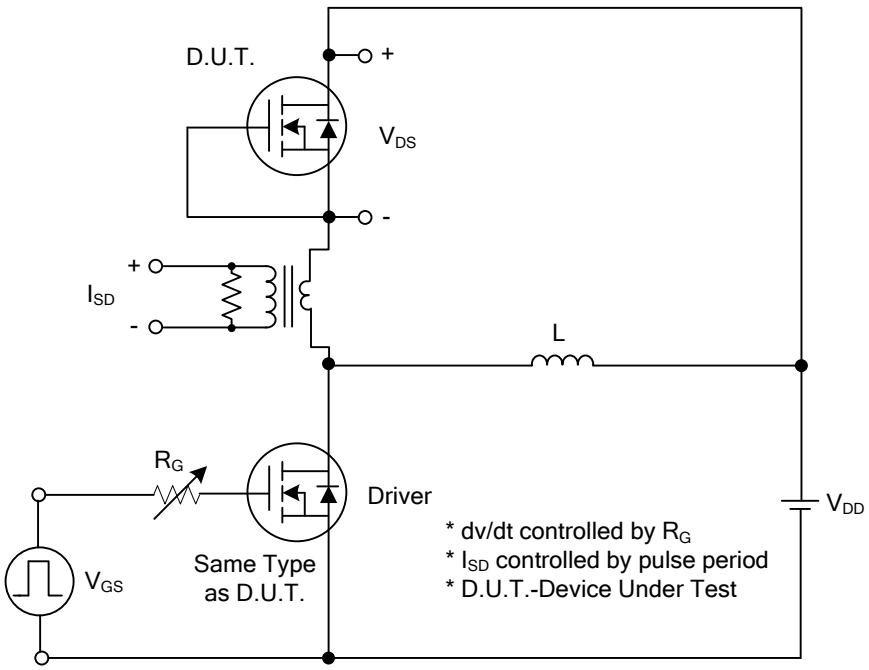
Note: Device mounted on FR-4 substrate P_C board, 2oz copper, with 1inch square copper plate.

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

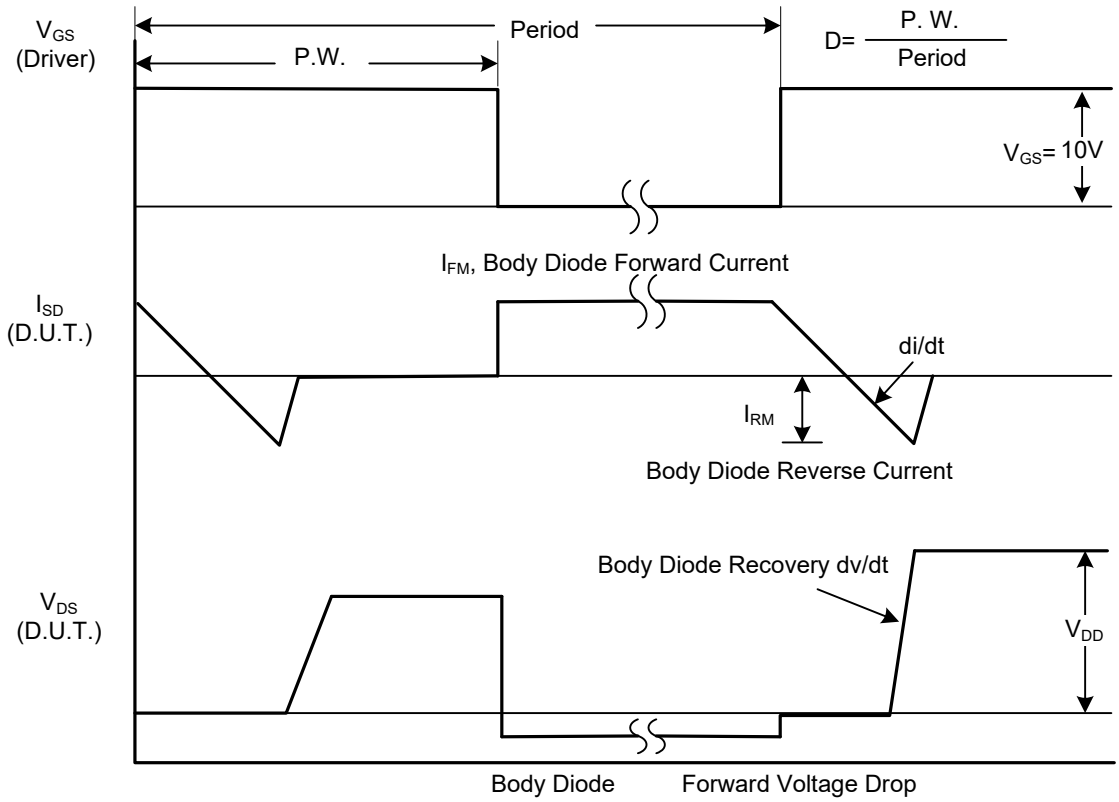
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=24V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±12V			±100	nA
ON CHARACTERISTICS						
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			105	mΩ
		V_{GS}=2.5V, I_D=1.2A			128	mΩ
		V_{GS}=1.8V, I_D=0.7A			180	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=2A (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=2A, 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=2A, V_{GS}=0V			1.2	V

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

■ TEST CIRCUITS AND WAVEFORMS

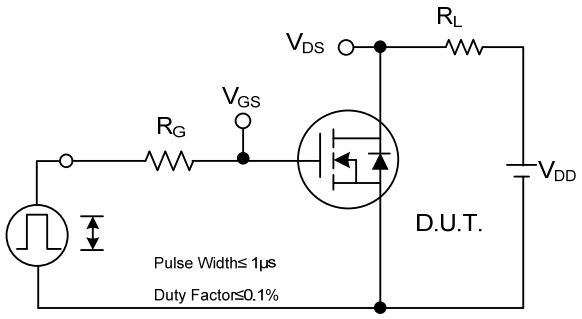


Peak Diode Recovery dv/dt Test Circuit

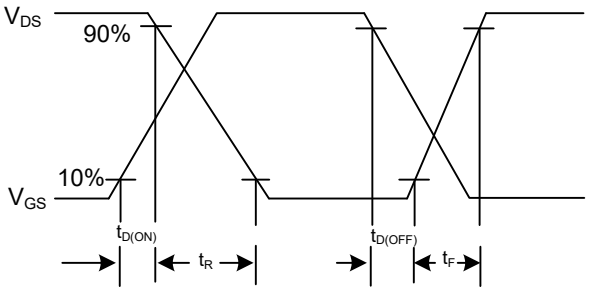


Peak Diode Recovery dv/dt Waveforms

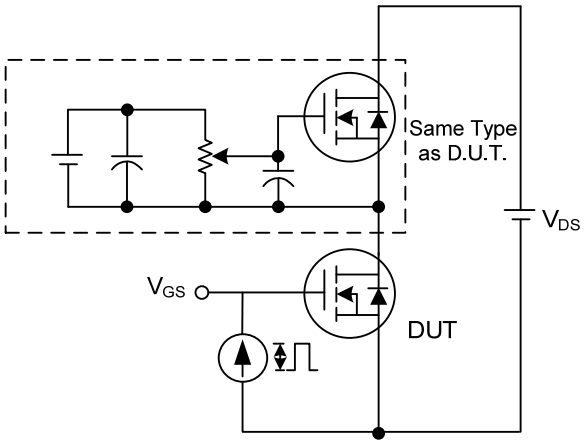
■ TEST CIRCUITS AND WAVEFORMS



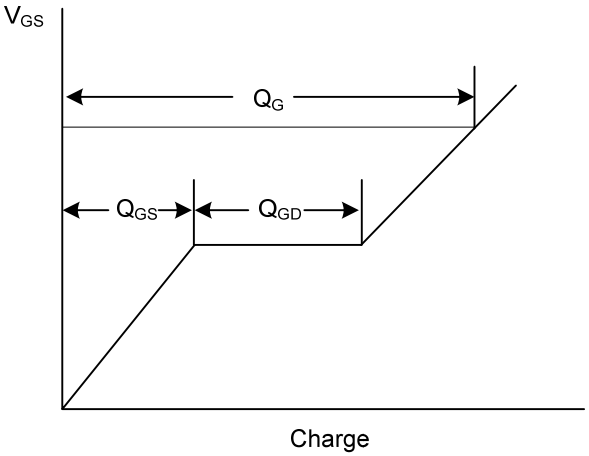
Switching Test Circuit



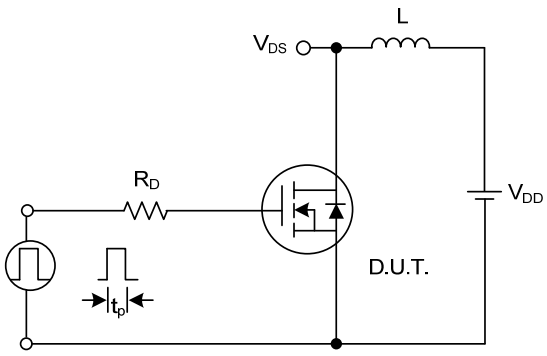
Switching Waveforms



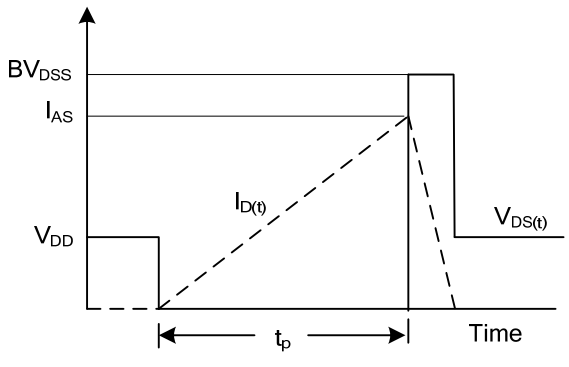
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms