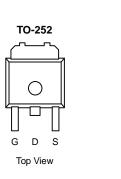
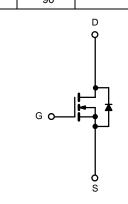


### UT85N03L-TN3-T-VB Datasheet N-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY							
V <sub>DS</sub> (V)	R <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A) <sup>a, e</sup>	Q <sub>g</sub> (Typ)				
30	0.002 at V <sub>GS</sub> = 10 V	100	72 nC				
30	0.003 at V <sub>GS</sub> = 4.5 V	90	72110				





N-Channel MOSFET

#### **FEATURES**

- ٠ Trench Power MOSFET
- 100 % R<sub>g</sub> and UIS Tested
- Compliant to RoHS Directive 2011/65/EU ٠

#### **APPLICATIONS**

- OR-ing
- Server
- DC/DC

Parameter		Symbol	Limit	Unit	
Drain-Source Voltage		V <sub>DS</sub>	30	V	
Gate-Source Voltage		V <sub>GS</sub>	± 20		
	T <sub>C</sub> = 25 °C		100 <sup>a, e</sup>		
Continuous Drain Current (T $= 175$ °C)	T <sub>C</sub> = 70 °C		80 <sup>e</sup>		
Continuous Drain Current (T <sub>J</sub> = 175 °C)	T <sub>A</sub> = 25 °C	I <sub>D</sub>	35.8 <sup>b, c</sup>	A	
	T <sub>A</sub> = 70 °C		27 <sup>b, c</sup>	A .	
Pulsed Drain Current		I <sub>DM</sub>	300		
Avalanche Current Pulse		I <sub>AS</sub>	39		
Single Pulse Avalanche Energy	L = 0.1 mH	E <sub>AS</sub>	94.8	mJ	
Continuous Source Drain Diade Current	T <sub>C</sub> = 25 °C	1	90 <sup>a, e</sup>		
Continuous Source-Drain Diode Current	T <sub>A</sub> = 25 °C	I <sub>S</sub>	3.13 <sup>b, c</sup>	— A	
	T <sub>C</sub> = 25 °C		235 <sup>a</sup>		
Marian Dissisting	T <sub>C</sub> = 70 °C	PD	165		
Maximum Power Dissipation	T <sub>A</sub> = 25 °C	FD	3.75 <sup>b, c</sup>	W	
	T <sub>A</sub> = 70 °C		2.63 <sup>b, c</sup>		
Operating Junction and Storage Temperature Ra	T <sub>J</sub> , T <sub>stg</sub>	- 55 to 175	°C		

THERMAL RESISTANCE RATINGS						
Parameter		Symbol	Тур.	Max.	Unit	
Maximum Junction-to-Ambient <sup>b, d</sup>	$t \le 10 \text{ sec}$	R <sub>thJA</sub>	32	40	°C/W	
Maximum Junction-to-Case	Steady State	R <sub>thJC</sub>	0.5	0.6	0/10	

Notes:

a. Based on T<sub>C</sub> = 25 °C. b. Surface mounted on 1" x 1" FR4 board.

a. t = 10 sec.
d. Maximum under steady state conditions is 90 °C/W.
e. Calculated based on maximum junction temperature. Package limitation current is 90 A.

服务热线:400-655-8788

## RoHS COMPLIANT

Drain-Source Breakdown Voltage V<sub>DS</sub> Temperature Coefficient V<sub>GS(th)</sub> Temperature Coefficient Gate-Source Threshold Voltage

Zero Gate Voltage Drain Current

Drain-Source On-State Resistance<sup>a</sup>

Gate-Source Leakage

On-State Drain Current<sup>a</sup>

Forward Transconductance<sup>a</sup>

Reverse Transfer Capacitance

**Total Gate Charge** 

Dynamic<sup>b</sup> Input Capacitance Output Capacitance

Parameter Static

SPECIFICATIONS (T, I = 25 °C,

				(	R	<sup>®</sup> VBse	
					www.V	Bsemi.c	
1	nless othe	rwise noted)					
u	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
	<b>e</b> j			.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
1	V <sub>DS</sub>	$V_{GS} = 0 V, I_{D} = 250 \mu A$	30			V	
	$\Delta V_{DS}/T_{J}$	L 050.04		35		24/20	
	$\Delta V_{GS(th)}/T_J$	I <sub>D</sub> = 250 μA		- 7.5		mV/°C	
	V <sub>GS(th)</sub>	$V_{DS} = V_{GS}, I_D = 250 \ \mu A$	1.5		2.5	V	
	I <sub>GSS</sub>	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA	
	I <sub>DSS</sub>	$V_{DS} = 30 \text{ V}, \text{ V}_{GS} = 0 \text{ V}$			1	μA	
		$V_{DS} = 30 \text{ V}, \text{ V}_{GS} = 0 \text{ V}, \text{ T}_{J} = 55 ^{\circ}\text{C}$			10		
	I <sub>D(on)</sub>	$V_{DS} \ge 5 \text{ V}, \text{ V}_{GS} = 10 \text{ V}$	90			А	
	D	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 38.8 A		0.002		Ω	
	R <sub>DS(on)</sub>	$V_{GS} = 4.5 \text{ V}, \text{ I}_{D} = 37 \text{ A}$		0.003			
	9 <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 38.8 A		160		S	
				•	•		
	C <sub>iss</sub>			5201			
	C <sub>oss</sub>	$V_{DS}$ = 15 V, $V_{GS}$ = 0 V, f = 1 MHz		1525		pF	
	C <sub>rss</sub>			770		]	
	Qg	$V_{DS}$ = 15 V, $V_{GS}$ = 10 V, $I_{D}$ = 38.8 A		151	227		
	≺g			71.5	103	nC	
	Q <sub>gs</sub>	$V_{DS}$ = 15 V, $V_{GS}$ = 4.5 V, $I_{D}$ = 28.8 A		30		ne	
	Q <sub>gd</sub>			24			
	Rg	f = 1 MHz		1.4	2.1	Ω	
	t <sub>d(on)</sub>			18	27		
	t <sub>r</sub>	$V_{DD}$ = 15 V, $R_L$ = 0.625 $\Omega$		11	17		
1						1	

Gate-Source Charge	Q <sub>gs</sub>	$V_{DS} = 15 \text{ V}, \text{ V}_{GS} = 4.5 \text{ V}, \text{ I}_{D} = 28.8 \text{ A}$	30		nC
Gate-Drain Charge	Q <sub>gd</sub>		24		
Gate Resistance	Rg	f = 1 MHz	1.4	2.1	Ω
Turn-On Delay Time	t <sub>d(on)</sub>		18	27	
Rise Time	t <sub>r</sub>	$V_{DD}$ = 15 V, $R_L$ = 0.625 $\Omega$	11	17	
Turn-Off Delay Time	t <sub>d(off)</sub>	$\text{I}_\text{D}\cong$ 24 A, $\text{V}_\text{GEN}$ = 10 V, $\text{R}_\text{g}$ = 1 $\Omega$	70	105	
Fall Time	t <sub>f</sub>		10	15	
Turn-On Delay Time	t <sub>d(on)</sub>		55	83	ns
Rise Time	t <sub>r</sub>	$V_{DD}$ = 15 V, R <sub>L</sub> = 0.67 $\Omega$	180	270	
Turn-Off Delay Time	t <sub>d(off)</sub>	$I_D \cong$ 22.5 A, $V_{GEN}$ = 4.5 V, $R_g$ = 1 $\Omega$	55	83	
Fall Time	t <sub>f</sub>		12	18	
Drain-Source Body Diode Characteristics	S			•	
Continuous Source-Drain Diode Current	ا <sub>S</sub>	T <sub>C</sub> = 25 °C		120	А
Pulse Diode Forward Current <sup>a</sup>	I <sub>SM</sub>			120	A
Body Diode Voltage	V <sub>SD</sub>	I <sub>S</sub> = 22 A	0.8	1.2	V
Body Diode Reverse Recovery Time	t <sub>rr</sub>		52	78	ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> = 20 A, di/dt = 100 A/μs, T <sub>J</sub> = 25 °C	70.2	105	nC
Reverse Recovery Fall Time	t <sub>a</sub>	$F = 20 \text{ A}, \text{ avat} = 100 \text{ A/} \mu \text{s}, \text{ I}_{\text{J}} = 25 \text{ C}$	27		20
Reverse Recovery Rise Time	t <sub>b</sub>		25		ns

Notes:

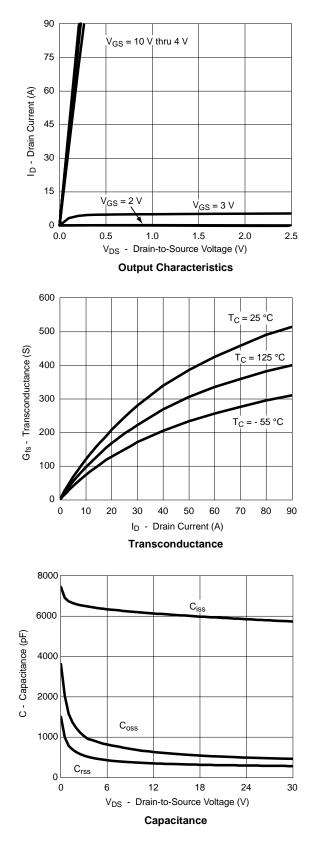
a. Pulse test; pulse width  $\leq$  300  $\mu s,$  duty cycle  $\leq$  2 %.

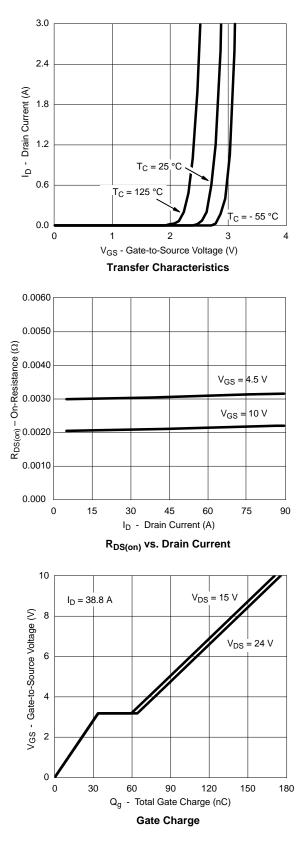
b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



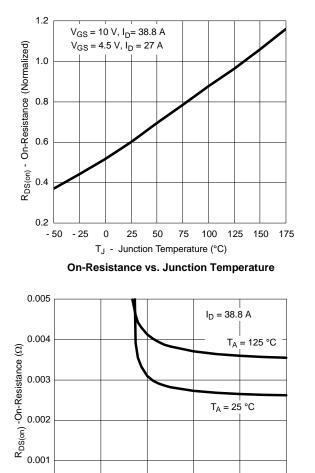
#### TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

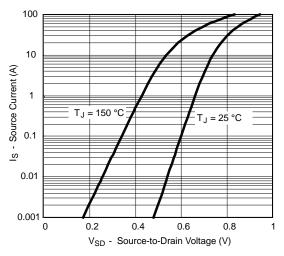




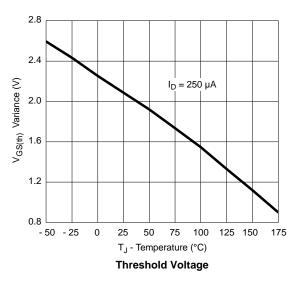


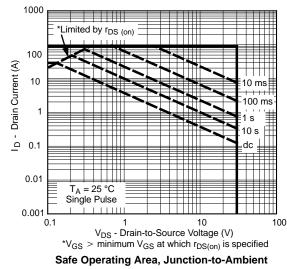
#### TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)





Forward Diode Voltage vs. Temperature





0.000

0

2

4

6

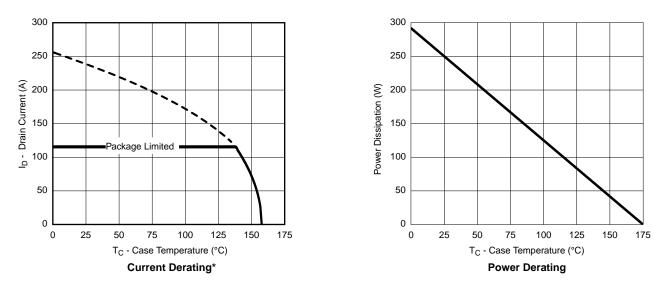
 $V_{GS}$  - Gate-to-Source Voltage (V)

 $R_{DS(on)}$  vs.  $V_{GS}$  vs. Temperature

8

10





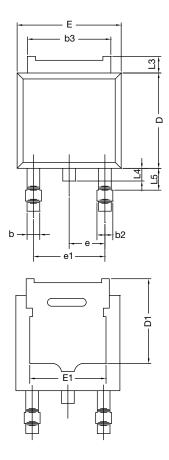
#### TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

\*The power dissipation  $P_D$  is based on  $T_{J(max)} = 175$  °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.





## **TO-252AA CASE OUTLINE**





	MILLIN	IETERS	INCHES			
DIM.	MIN.	MIN. MAX.		MAX.		
А	2.18	2.38	0.086	0.094		
A1	-	0.127	-	0.005		
b	0.64	0.88	0.025	0.035		
b2	0.76	1.14	0.030	0.045		
b3	4.95	5.46	0.195	0.215		
С	0.46	0.61	0.018	0.024		
C2	0.46	0.89	0.018	0.035		
D	5.97	6.22	0.235	0.245		
D1	5.21	-	0.205	-		
Е	6.35	6.73	0.250	0.265		
E1	4.32	-	0.170	-		
Н	9.40	10.41	0.370	0.410		
е	2.28	BSC	0.090 BSC			
e1	4.56 BSC		0.180 BSC			
L	1.40	1.78	0.055	0.070		
L3	0.89	1.27	0.035	0.050		
L4	-	1.02	-	0.040		
L5	1.14	1.52	0.045	0.060		
ECN: X12-0247-Rev. M, 24-Dec-12 DWG: 5347						

#### Note

• Dimension L3 is for reference only.



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