

### NTD2955D-VB Datasheet

## P-Channel 60-V (D-S) MOSFET

PRODUCT SUMMARY					
V <sub>DS</sub> (V)	<b>R<sub>DS(on)</sub> (</b> Ω <b>)</b>	I <sub>D</sub> (A)	Q <sub>g</sub> (Typ)		
- 60	0.061 at V <sub>GS</sub> = - 10 V	- 30	10		
- 00	0.072 at V <sub>GS</sub> = - 4.5 V	- 25	10		

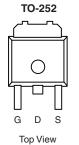
### FEATURES

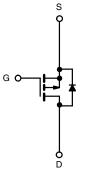
- Trench Power MOSFET
- 100 % UIS Tested

### **APPLICATIONS**

Load Switch







P-Channel MOSFET

Parameter	Symbol	Limit	Unit		
Gate-Source Voltage	V <sub>GS</sub>	± 20	V		
Continuous Drain Current ( $T_1 = 175 ^{\circ}C$ )	T <sub>C</sub> = 25 °C	1_	- 30		
Continuous Drain Current (1) = 175 C)	T <sub>C</sub> = 100 °C	I <sub>D</sub>	- 25	-	
Pulsed Drain Current	I <sub>DM</sub>	- 30	A		
Continuing Source Current (Diode Conduction)	۱ <sub>S</sub>	- 20			
Avalanche Current	I <sub>AS</sub>	- 20	1		
Single Pulse Avalanche Energy	L = 0.1 mH	E <sub>AS</sub>	7.2	mJ	
Maximum Dawar Dissinction	T <sub>C</sub> = 25 °C	Р	34 <sup>a</sup>	w	
Maximum Power Dissipation	T <sub>A</sub> = 25 °C	P <sub>D</sub>	4 <sup>b</sup>		
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stq</sub>	- 55 to 175	°C		

THERMAL RESISTANCE RATINGS						
Parameter		Symbol	Typical	Maximum	Unit	
hundling to Anching b	t ≤ 10 sec	R <sub>thJA</sub>	20	25	°C/W	
Junction-to-Ambient <sup>D</sup>	Steady State	''thJA	62	75		
Junction-to-Case		R <sub>thJC</sub>	5	6		

Notes:

a. See SOA curve for voltage derating.

b. Surface Mounted on 1" x 1" FR-4 boad.

Static         7.1         7.1           Drain-Source Breakdown Voltage $V_{(BFI)DSS}$ $V_{GS} = 0$ , $V_{DS} = -250$ $\mu$ A         -60         -3.0           Gate Threshold Voltage $V_{GS}(m)$ $V_{DS} = V, V_{GS} = -250$ $\mu$ A         -1.0         -2.0         -3.0           Gate Threshold Voltage $I_{GSS}$ $V_{DS} = 0$ , $V_{GS} = 220$ $\mu$ A         -1.0         -2.0         -3.0           Gate Body Leakage $I_{GSS}$ $V_{DS} = 0$ , $V_{VGS} = 20$ $V$ -1.0         -2.0         -3.0           Zero Gate Voltage Drain Current $I_{DSS}$ $V_{DS} = -60$ , $V_{GS} = 0$ $V, T_J = 125$ $^{\circ}C$ -50         -50           On-State Drain Current <sup>b</sup> $I_{D(on)}$ $V_{DS} = -50$ , $V_{GS} = 0$ , $V, T_J = 125$ $^{\circ}C$ 0.061         -10           Drain-Source On-State Resistance <sup>b</sup> $r_{D(on)}$ $V_{DS} = -5$ , $V_{GS} = -10$ $V, I_D = -5$ $A$ , $T_J = 125$ $^{\circ}C$ 0.100         -000           Torin-Source On-State Resistance $G_{150}$ $V_{DS} = -15$ $V, I_D = -5$ $A$ , $T_J = 125$ $^{\circ}C$ 0.100         -0000           Poynamic	<b>SPECIFICATIONS</b> $T_J = 25$	°C, unless o	otherwise noted					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Parameter	Symbol	Test Conditions	Min	Typ <sup>a</sup>	Max	Unit	
Gate Threshold Voltage         VGS(h)         VDS = VGS, h = -250 \muA         -1.0         -2.0         -3.0           Gate-Body Leakage         IGSS         VDS = 0, VGS = 20 V         ±100         ±	Static							
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	$V_{GS}$ = 0 V, $I_D$ = - 250 $\mu$ A	- 60			V	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Gate Threshold Voltage	V <sub>GS(th)</sub>	$V_{DS} = V_{GS}$ , $I_D = -250 \ \mu A$	- 1.0	- 2.0	- 3.0	v	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Gate-Body Leakage	I <sub>GSS</sub>	$V_{DS}$ = 0 V, $V_{GS}$ = ± 20 V			± 100	nA	
$ \begin{array}{ c c c c c c } \hline V_{DS} = - 60 \ V, \ V_{GS} = 0 \ V, \ T_J = 175 \ ^{\circ} C & & & - 150 \\ \hline V_{DS} = - 50 \ V, \ V_{GS} = - 10 \ V & & - 10 & & & \\ \hline V_{OS} = - 5 \ V, \ V_{GS} = - 10 \ V & & - 10 & & & \\ \hline V_{OS} = - 10 \ V, \ I_D = - 5 \ A & & & 0.061 & & \\ \hline V_{OS} = - 10 \ V, \ I_D = - 5 \ A & & & & 0.061 & & \\ \hline V_{OS} = - 10 \ V, \ I_D = - 5 \ A, \ T_J = 125 \ ^{\circ} C & & & 0.100 & & \\ \hline V_{OS} = - 10 \ V, \ I_D = - 5 \ A, \ T_J = 175 \ ^{\circ} C & & & 0.150 & & \\ \hline V_{OS} = - 10 \ V, \ I_D = - 5 \ A & & & & 0.061 & & \\ \hline V_{OS} = - 10 \ V, \ I_D = - 5 \ A & & & & & 0.072 & & \\ \hline \hline Purmer & Primer & Primer & Primer & Primer & Primer & Primer & & \\ \hline Dynamic & & & & & & \\ \hline Dynamic & & & & & & \\ \hline Dut Capacitance & C_{ISS} & & & & & & \\ \hline Output Capacitance & C_{CSS} & & & & & & \\ \hline Output Capacitance & C_{CSS} & & & & & \\ \hline Output Capacitance & C_{CSS} & & & & & \\ \hline Output Capacitance & C_{CSS} & & & & & \\ \hline Total Gate Charge & Q_{g} & & & \\ \hline Gate Charge & Q_{g} & & & \\ \hline Gate Source Charge & Q_{g} & & & \\ \hline Gate Resistance & R_g & f = 1 \ MHz & & & & & \\ \hline Turn-On Delay Time^{\circ} & t_d(on) & & \\ \hline Rise Time^{\circ} & t_f & & \\ \hline V_{DD} = - 30 \ V, \ R_L = 3.57 \ \Omega & & & & \\ \hline D_{D} = - 8.4 \ A, \ V_{GS} = - 10 \ V, \ R_G = 2.5 \ \Omega & & & \\ \hline 100 & & & \\ \hline Source-Drain Diode Ratings and Charzeteristics & (T_C = 25 \ ^{\circ}C)^{b} & \\ \hline Pulsed Current & I_{SM} & & & \\ \hline Pulsed Current & I_{SM} & & & \\ \hline Fervard Voltage^{b} & V_{SD} & \\ \hline Fervard Voltage^{b} & V_{SD} & & \\ \hline Fervard Voltage^{b} & V_{SD} & \\ \hline Fervard Volta$			$V_{DS} = -60 \text{ V}, V_{GS} = 0 \text{ V}$			- 1		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Zero Gate Voltage Drain Current	I <sub>DSS</sub>	$V_{DS}$ = - 60 V, $V_{GS}$ = 0 V, $T_{J}$ = 125 °C			- 50	μΑ	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			$V_{DS}$ = - 60 V, $V_{GS}$ = 0 V, $T_{J}$ = 175 °C			- 150		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	On-State Drain Current <sup>b</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = - 5 V, V <sub>GS</sub> = - 10 V	- 10			А	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			V <sub>GS</sub> = - 10 V, I <sub>D</sub> = - 5 A		0.061			
$ \begin{array}{ c c c c c c c } \hline V_{GS} = -10 \ V, \ I_D = -5 \ A, \ I_J = 175 \ C & 0.150 \\ \hline V_{GS} = -4.5 \ V, \ I_D = -2 \ A & 0.072 \\ \hline V_{GS} = -4.5 \ V, \ I_D = -2 \ A & 0.072 \\ \hline \hline V_{GS} = -4.5 \ V, \ I_D = -5 \ A & 8 \\ \hline \hline Dynamic & & & & & & & & & & & & & & & & & & \\ \hline \hline Dynamic & & & & & & & & & & & & & & & & & & &$		r	$V_{GS}$ = - 10 V, I <sub>D</sub> = - 5 A, T <sub>J</sub> = 125 °C		0.100			
Forward Transconductance <sup>b</sup> $g_{fs}$ $V_{DS} = -15$ V, $I_D = -5$ A       8         Dynamic       1000       1000         Input Capacitance $C_{iss}$ 1000       1000         Output Capacitance $C_{oss}$ $V_{DS} = -25$ V, $V_{GS} = 0$ V, $f = 1$ MHz       120       1000         Reverse Transfer Capacitance $C_{rss}$ 1000       1000       1000       1000         Total Gate Charge $Q_g$ $V_{DS} = -30$ V, $V_{GS} = -10$ V, $I_D = -8.4$ A       2.1       1000       1000         Gate-Source Charge $Q_{gd}$ $V_{DS} = -30$ V, $V_{GS} = -10$ V, $I_D = -8.4$ A       2.1       1000 <th< td=""><td>Drain-Source On-State Resistance</td><td>DS(on)</td><td><math>V_{GS}</math> = - 10 V, I<sub>D</sub> = - 5 A, T<sub>J</sub> = 175 °C</td><td></td><td>0.150</td><td></td><td>Ω</td></th<>	Drain-Source On-State Resistance	DS(on)	$V_{GS}$ = - 10 V, I <sub>D</sub> = - 5 A, T <sub>J</sub> = 175 °C		0.150		Ω	
Dynamic         Input Capacitance         C <sub>iss</sub> Input Capacitance         C <sub>iss</sub> Output Capacitance         C <sub>oss</sub> $V_{DS} = -25 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$ 1000         1000           Reverse Transfer Capacitance         C <sub>rss</sub> 1000         1000         1000           Total Gate Charge         Qg $V_{DS} = -30 \text{ V}, V_{GS} = -10 \text{ V}, I_D = -8.4 \text{ A}$ 2.1         100           Gate-Source Charge         Qgd $V_{DS} = -30 \text{ V}, V_{GS} = -10 \text{ V}, I_D = -8.4 \text{ A}$ 2.1         10           Gate-Drain Charge         Qgd $V_{DS} = -30 \text{ V}, V_{GS} = -10 \text{ V}, I_D = -8.4 \text{ A}$ 2.1         10           Gate Resistance         Rg         f = 1 \text{ MHz}         8.0         3.2         6           Turn-On Delay Time <sup>c</sup> td <sub>(don)</sub> $V_{DD} = -30 \text{ V}, R_L = 3.57 \Omega$ 155         15           Turn-Off Delay Time <sup>c</sup> tf $V_{DD} = -30 \text{ V}, R_G = 2.5 \Omega$ 166         6           Source-Drain Diode Ratings and Characteristics $(T_C = 25 \text{ °C})^b$ 8         50         -30           Pulsed Current         IsM         -30         -30         -30         -30         -30         -30         -30         -30         -30 <t< td=""><td></td><td></td><td>V<sub>GS</sub> = - 4.5 V, I<sub>D</sub> = - 2 A</td><td></td><td>0.072</td><td></td><td colspan="2"></td></t<>			V <sub>GS</sub> = - 4.5 V, I <sub>D</sub> = - 2 A		0.072			
$ \begin{array}{ c c c c c c c } \mbox{Input Capacitance} & C_{iss} & V_{DS} = -25 \ V, \ V_{GS} = 0 \ V, \ f = 1 \ MHz & 120 & 100$	Forward Transconductance <sup>b</sup>	9 <sub>fs</sub>	V <sub>DS</sub> = - 15 V, I <sub>D</sub> = - 5 A		8		S	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Dynamic	÷	•		÷			
Reverse Transfer Capacitance $C_{rss}$ 100         Total Gate Charge $Q_g$ $V_{DS} = -30 \text{ V}, V_{GS} = -10 \text{ V}, I_D = -8.4 \text{ A}$ 2.1       10         Gate-Source Charge $Q_{gd}$ $V_{DS} = -30 \text{ V}, V_{GS} = -10 \text{ V}, I_D = -8.4 \text{ A}$ 2.1       10         Gate-Drain Charge $Q_{gd}$ $f = 1 \text{ MHz}$ 8.0       3.2       10         Gate Resistance $R_g$ $f = 1 \text{ MHz}$ 8.0       10       10         Turn-On Delay Time <sup>c</sup> $t_{d(on)}$ $V_{DD} = -30 \text{ V}, R_L = 3.57 \Omega$ 15       15         Rise Time <sup>c</sup> $t_r$ $I_D \cong -8.4 \text{ A}, V_{GEN} = -10 \text{ V}, R_G = 2.5 \Omega$ 16       16         Fall Time <sup>c</sup> $t_f$ $I_D \cong -8.4 \text{ A}, V_{GEN} = 0 \text{ V}$ 3.2       16       16         Source-Drain Diode Ratings and Characteristics $(T_C = 25 \text{ °C})^b$ -30       -30       16       16         Pulsed Current       ISM       I_F = -2 \text{ A}, V_{GS} = 0 \text{ V}       -0.9       -1.3       50         Beverse Becovery Time $t_r$ 50       50       50       50       50	Input Capacitance	C <sub>iss</sub>			1000			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Output Capacitance	C <sub>oss</sub>	$V_{DS} = -25 \text{ V}, V_{GS} = 0 \text{ V}, \text{ f} = 1 \text{ MHz}$		120		pF	
Gate-Source Charge $Q_{gs}$ $V_{DS} = -30 \text{ V}, V_{GS} = -10 \text{ V}, I_D = -8.4 \text{ A}$ 2.1       1         Gate-Drain Charge $Q_{gd}$ $3.2$ $3.2$ $3.2$ $3.2$ $3.2$ Gate Resistance $R_g$ $f = 1 \text{ MHz}$ $8.0$ $3.2$ $66$ $66$ Turn-On Delay Time <sup>c</sup> $t_{d(on)}$ $V_{DD} = -30 \text{ V}, R_L = 3.57 \Omega$ $15$ $16$ Rise Time <sup>c</sup> $t_r$ $V_{DD} = -30 \text{ V}, R_G = 2.5 \Omega$ $16$ $88$ Turn-Off Delay Time <sup>c</sup> $t_f$ $10 \cong -8.4 \text{ A}, V_{GEN} = -10 \text{ V}, R_G = 2.5 \Omega$ $16$ $70$ Fall Time <sup>c</sup> $t_f$ $12 \cong -8.4 \text{ A}, V_{GEN} = -10 \text{ V}, R_G = 2.5 \Omega$ $16$ $70$ Pulsed Current $t_f$ $88$ $70$ $70$ $70$ Pulsed Current $I_{SM}$ $-30$ $-30$ $70$ $70$ $70$ Forward Voltage <sup>b</sup> $V_{SD}$ $I_F = -2 \text{ A}, V_{GS} = 0 \text{ V}$ $-0.9$ $-1.3$ $70$ Reverse Becovery Time $t_{rr}$ $50$ $70$ $70$ $70$ $70$	Reverse Transfer Capacitance	C <sub>rss</sub>			100		1	
Gate-Drain Charge $Q_{gd}$ 3.2         Gate Resistance $R_g$ $f = 1 \text{ MHz}$ 8.0         Turn-On Delay Time <sup>c</sup> $t_{d(on)}$ $f = 1 \text{ MHz}$ 6         Rise Time <sup>c</sup> $t_r$ $V_{DD} = -30 \text{ V}, R_L = 3.57 \Omega$ 15         Turn-Off Delay Time <sup>c</sup> $t_d(off)$ $I_D \cong -8.4 \text{ A}, V_{GEN} = -10 \text{ V}, R_G = 2.5 \Omega$ 16         Fall Time <sup>c</sup> $t_f$ 8       16         Source-Drain Diode Ratings and Characteristics $(T_C = 25 \text{ °C})^b$ -30         Pulsed Current $I_{SM}$ -30         Forward Voltage <sup>b</sup> $V_{SD}$ $I_F = -2 \text{ A}, V_{GS} = 0 \text{ V}$ -0.9       -1.3         Beverse Becovery Time $t_r$ 50       50       50	Total Gate Charge	Qg			10		nC	
Gate Resistance $R_g$ $f = 1 \text{ MHz}$ $8.0$ Turn-On Delay Time <sup>c</sup> $t_{d(on)}$ Rise Time <sup>c</sup> $t_r$ $V_{DD} = -30 \text{ V}, R_L = 3.57 \Omega$ $15$ Turn-Off Delay Time <sup>c</sup> $t_d(off)$ $I_D \cong -8.4 \text{ A}, V_{GEN} = -10 \text{ V}, R_G = 2.5 \Omega$ $16$ Fall Time <sup>c</sup> $t_f$ Pulsed Current $I_{SM}$ $-30$ Forward Voltage <sup>b</sup> $V_{SD}$ $I_F = -2 \text{ A}, V_{GS} = 0 \text{ V}$ $-0.9$ $-1.3$	Gate-Source Charge	Q <sub>gs</sub>	$V_{DS}$ = - 30 V, $V_{GS}$ = - 10 V, $I_{D}$ = - 8.4 A		2.1			
$ \begin{array}{c c c c c c c c c } \hline Turn-On \ Delay \ Time^{c} & t_{d(on)} & & & & & & & & & & & & & & & & & & &$	Gate-Drain Charge	Q <sub>gd</sub>			3.2		1	
Rise Time <sup>c</sup> $t_r$ $V_{DD} = -30 \text{ V}, \text{ R}_L = 3.57 \Omega$ 15Turn-Off Delay Time <sup>c</sup> $t_{d(off)}$ $l_D \approx -8.4 \text{ A}, V_{GEN} = -10 \text{ V}, \text{ R}_G = 2.5 \Omega$ 16Fall Time <sup>c</sup> $t_f$ 8Source-Drain Diode Ratings and CharacteristicsPulsed Current $l_{SM}$ $-30$ Forward Voltage <sup>b</sup> $V_{SD}$ $I_F = -2 \text{ A}, V_{GS} = 0 \text{ V}$ $-0.9$ Pulsed Encovery Time $t_r$ 50	Gate Resistance	Rg	f = 1 MHz		8.0		Ω	
Turn-Off Delay Time <sup>c</sup> $t_{d(off)}$ $I_D \cong -8.4$ Å, $V_{GEN} = -10$ V, $R_G = 2.5 \Omega$ 16Fall Time <sup>c</sup> $t_f$ $R_G = 2.5 \Omega$ 16Source-Drain Diode Ratings and Characteristics $(T_C = 25 °C)^b$ $R_G = 2.5 \Omega$ Pulsed Current $I_{SM}$ $-30$ Forward Voltage <sup>b</sup> $V_{SD}$ $I_F = -2$ A, $V_{GS} = 0$ V $-0.9$ Beverse Becovery Time $t_r$ 50	Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>			6			
Turn-Off Delay Time <sup>c</sup> $t_{d(off)}$ $I_D \cong - 8.4 \text{ A}, V_{GEN} = -10 \text{ V}, H_G = 2.5 \Omega$ 16Fall Time <sup>c</sup> $t_f$ 8Source-Drain Diode Ratings and CharacteristicsPulsed Current $I_{SM}$ $-30$ Forward Voltage <sup>b</sup> $V_{SD}$ $I_F = -2 \text{ A}, V_{GS} = 0 \text{ V}$ $-0.9$ $-1.3$ Beverse Becovery Time $t_{rr}$ 50 $-100$	Rise Time <sup>c</sup>	t <sub>r</sub>	$V_{DD}$ = - 30 V, $R_{L}$ = 3.57 $\Omega$		15		ns	
Source-Drain Diode Ratings and Characteristics $(T_C = 25 \text{ °C})^b$ Pulsed Current       I <sub>SM</sub> - 30         Forward Voltage <sup>b</sup> V <sub>SD</sub> I <sub>F</sub> = - 2 A, V <sub>GS</sub> = 0 V       - 0.9       - 1.3         Beverse Becovery Time       tr       50       50	Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>	$\text{I}_\text{D}\cong$ - 8.4 A, $\text{V}_\text{GEN}$ = - 10 V, $\text{R}_\text{G}$ = 2.5 $\Omega$		16			
Pulsed Current         I <sub>SM</sub> - 30           Forward Voltage <sup>b</sup> V <sub>SD</sub> I <sub>F</sub> = -2 A, V <sub>GS</sub> = 0 V         - 0.9         - 1.3           Beverse Becovery Time         trr         50         - 1.3         - 1.3	Fall Time <sup>c</sup>	t <sub>f</sub>	] [		8			
Forward Voltageb $V_{SD}$ $I_F = -2 \text{ A}, V_{GS} = 0 \text{ V}$ $-0.9$ $-1.3$ Beverse Becovery Time $t_{rr}$ 50	Source-Drain Diode Ratings and Cha	racteristics	$(T_C = 25 \ ^{\circ}C)^b$					
Beverse Becovery Time trr 50	Pulsed Current	I <sub>SM</sub>				- 30	А	
Reverse Recovery Time t <sub>rr</sub> 50	Forward Voltage <sup>b</sup>	V <sub>SD</sub>	I <sub>F</sub> = - 2 A, V <sub>GS</sub> = 0 V		- 0.9	- 1.3	V	
	Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = - 8 A, di/dt = 100 A/μs		50		ns	
	Reverse Recovery Time	Q <sub>rr</sub>	$r_{\rm F} = -0.7$ , $u_{\rm F} u_{\rm F} = -0.7$ , $u_{\rm F} u_{\rm F} = -0.7$		80		nC	

Notes:

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

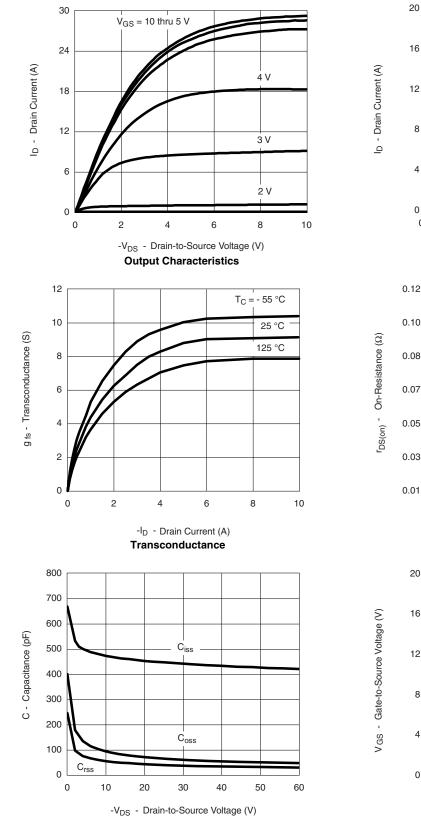
b. Pulse test; pulse width  $\leq$  300  $\mu s,$  duty cycle  $\leq$  2 %.

c. Independent of operating temperature.

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.

VBsemi VBsemi.com

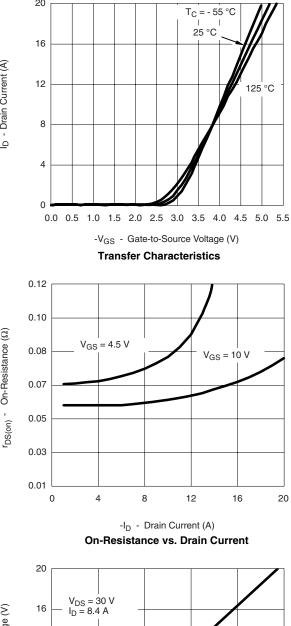


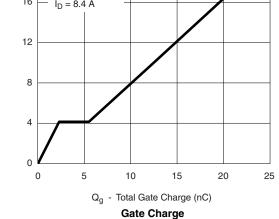


Capacitance

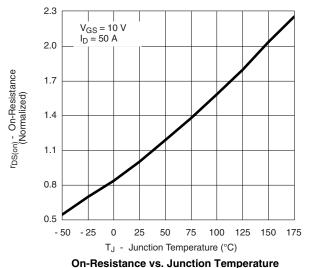
### TYPICAL CHARACTERISTICS 25 °C unless noted

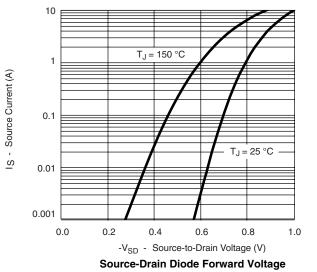
服务热线:400-655-8788





### TYPICAL CHARACTERISTICS 25 °C unless noted

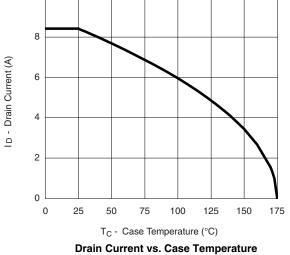


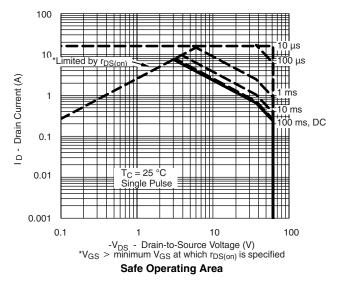


semi

www.VBsemi.com

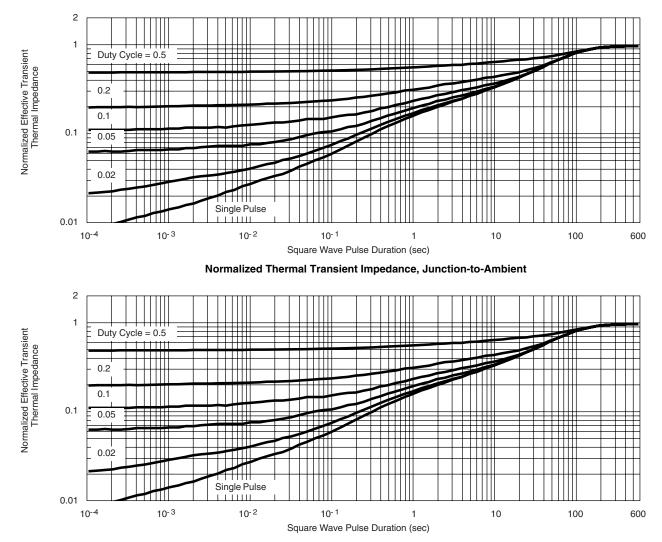
# 10







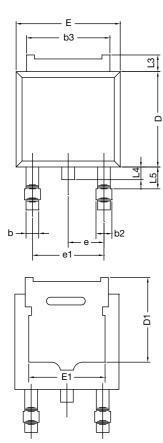
### THERMAL RATINGS

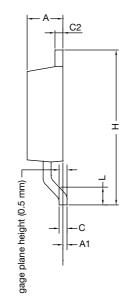


Normalized Thermal Transient Impedance, Junction-to-Case



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





	MILLIN	<b>IETERS</b>	INCHES		
DIM.	MIN.	MAX.	MIN.	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	-	
E	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-( DWG: 5347	0247-Rev. M,	24-Dec-12			

Note

• Dimension L3 is for reference only.



### **RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)**



Recommended Minimum Pads Dimensions in Inches/(mm)



## Disclaimer

All products due to improve reliability, function or design or for other reasons, product specifications and data are subject to change without notice.

Taiwan VBsemi Electronics Co., Ltd., branches, agents, employees, and all persons acting on its or their representatives (collectively, the "Taiwan VBsemi"), assumes no responsibility for any errors, inaccuracies or incomplete data contained in the table or any other any disclosure of any information related to the product.(www.VBsemi.com)

Taiwan VBsemi makes no guarantee, representation or warranty on the product for any particular purpose of any goods or continuous production. To the maximum extent permitted by applicable law on Taiwan VBsemi relinquished: (1) any application and all liability arising out of or use of any products; (2) any and all liability, including but not limited to special, consequential damages or incidental; (3) any and all implied warranties, including a particular purpose, non-infringement and merchantability guarantee.

Statement on certain types of applications are based on knowledge of the product is often used in a typical application of the general product VBsemi Taiwan demand that the Taiwan VBsemi of. Statement on whether the product is suitable for a particular application is non-binding. It is the customer's responsibility to verify specific product features in the products described in the specification is appropriate for use in a particular application. Parameter data sheets and technical specifications can be provided may vary depending on the application and performance over time. All operating parameters, including typical parameters must be made by customer's technical experts validated for each customer application. Product specifications do not expand or modify Taiwan VBsemi purchasing terms and conditions, including but not limited to warranty herein.

Unless expressly stated in writing, Taiwan VBsemi products are not intended for use in medical, life saving, or life sustaining applications or any other application. Wherein VBsemi product failure could lead to personal injury or death, use or sale of products used in Taiwan VBsemi such applications using client did not express their own risk. Contact your authorized Taiwan VBsemi people who are related to product design applications and other terms and conditions in writing.

The information provided in this document and the company's products without a license, express or implied, by estoppel or otherwise, to any intellectual property rights granted to the VBsemi act or document. Product names and trademarks referred to herein are trademarks of their respective representatives will be all.

## **Material Category Policy**

Taiwan VBsemi Electronics Co., Ltd., hereby certify that all of the products are determined to be oHS compliant and meets the definition of restrictions under Directive of the European Parliament 2011/65 / EU, 2011 Nian. 6. 8 Ri Yue restrict the use of certain hazardous substances in electrical and electronic equipment (EEE) - modification, unless otherwise specified as inconsistent.(www.VBsemi.com)

Please note that some documents may still refer to Taiwan VBsemi RoHS Directive 2002/95 / EC. We confirm that all products identified as consistent with the Directive 2002/95 / EC European Directive 2011/65 /.

Taiwan VBsemi Electronics Co., Ltd. hereby certify that all of its products comply identified as halogen-free halogen-free standards required by the JEDEC JS709A. Please note that some Taiwanese VBsemi documents still refer to the definition of IEC 61249-2-21, and we are sure that all products conform to confirm compliance with IEC 61249-2-21 standard level JS709A.