

General Description:

The JS3N10AD3D uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications. The package form is DFN3.3*3.3, which accords with the RoHS standard.

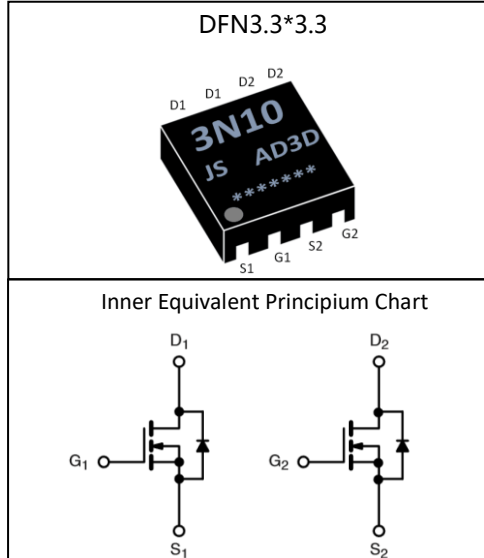
Features:

- Fast Switching
- Low Gate Charge and Rdson
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

Applications:

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

V _{DSS}	100	V
I _D	3	A
P _D	1.5	W
R _{DS(ON) TYPE}	0.155	Ω



Package Marking and Ordering Information:

Device Marking	Device	Device Package	Quantity
JS3N10AD3D	JS3N10AD3D	DFN3.3*3.3	5000 units

Absolute Maximum Ratings (TA= 25°C unless otherwise specified):

Symbol	Parameter	Rating	Units
V _{DSS}	Drain-to-Source Voltage	100	V
I _D	Continuous Drain Current	3.0	A
	Continuous Drain Current T _C = 100 °C	1.7	A
I _{DM} ^{a1}	Pulsed Drain Current	12	A
V _{GS}	Gate-to-Source Voltage	±20	V
E _{AS} ^{a2}	Single Pulse Avalanche Energy	50	mJ
E _{AR} ^{a1}	Avalanche Energy, Repetitive	1.25	mJ
I _{AR} ^{a1}	Avalanche Current	1.8	A
dv/dt ^{a3}	Peak Diode Recovery dv/dt	5.0	V/ns
P _D	Power Dissipation	1.5	W
T _J , T _{stg}	Operating Junction and Storage Temperature Range	150, -55 to 175	°C
T _L	Maximum Temperature for Soldering	300	°C

Electrical Characteristics ($T_c = 25^\circ\text{C}$ unless otherwise specified):

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	--	--	V
$\Delta BV_{DSS}/\Delta T_J$	BVdss Temperature Coefficient	$I_D=250\mu A, \text{Reference } 25^\circ\text{C}$	--	0.1	--	V/ $^\circ\text{C}$
I_{DSS}	Drain to Source Leakage Current	$V_{DS} = 100V, V_{GS} = 0V,$ $T_a = 25^\circ\text{C}$	--	--	1	μA
		$V_{DS} = 80V, V_{GS} = 0V,$ $T_a = 125^\circ\text{C}$	--	--	250	
$I_{GSS(F)}$	Gate to Source Forward Leakage	$V_{GS} = +20V$	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	$V_{GS} = -20V$	--	--	-100	nA

ON Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	$V_{GS}=10V, I_D=3.0A$	--	155	185	m Ω
$R_{DS(ON)}$	Drain-to-Source On-Resistance	$V_{GS}=6V, I_D=2.5A$	--	175	210	m Ω
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	--	3.0	V
Pulse width $t_p \leq 380\mu s, \delta \leq 2\%$						

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{fs}	Forward Transconductance	$V_{DS}=5V, I_D = 3A$	4	--	--	S
C_{iss}	Input Capacitance	$V_{GS} = 0V$	--	510	--	pF
C_{oss}	Output Capacitance	$V_{DS} = 50V$	--	18	--	
C_{rss}	Reverse Transfer Capacitance	$f = 1.0\text{MHz}$	--	15	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$I_D = 3.0A$	--	7	--	ns
t_r	Rise Time	$V_{DS} = 50V$	--	5	--	
$t_{d(OFF)}$	Turn-Off Delay Time	$V_{GS} = 10V$	--	20	--	
t_f	Fall Time	$R_G = 1.0\Omega$	--	5	--	
Q_g	Total Gate Charge	$I_D = 3A$	--	15	--	nC
Q_{gs}	Gate to Source Charge	$V_{DD} = 50V$	--	1.6	--	
Q_{gd}	Gate to Drain ("Miller") Charge	$V_{GS} = 10V$	--	2.5	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)		--	--	3	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	12	A
V_{SD}	Diode Forward Voltage	$I_S=3.0A, V_{GS}=0V$	--	--	1.5	V
t_{rr}	Reverse Recovery Time	$I_S=3.0A, T_j = 25^\circ$	--	50	--	ns
Q_{rr}	Reverse Recovery Charge	$dI_F/dt=100A/us, V_{GS}=0V$	--	180	--	nC
Pulse width $t_p \leq 380\mu s, \delta \leq 2\%$						

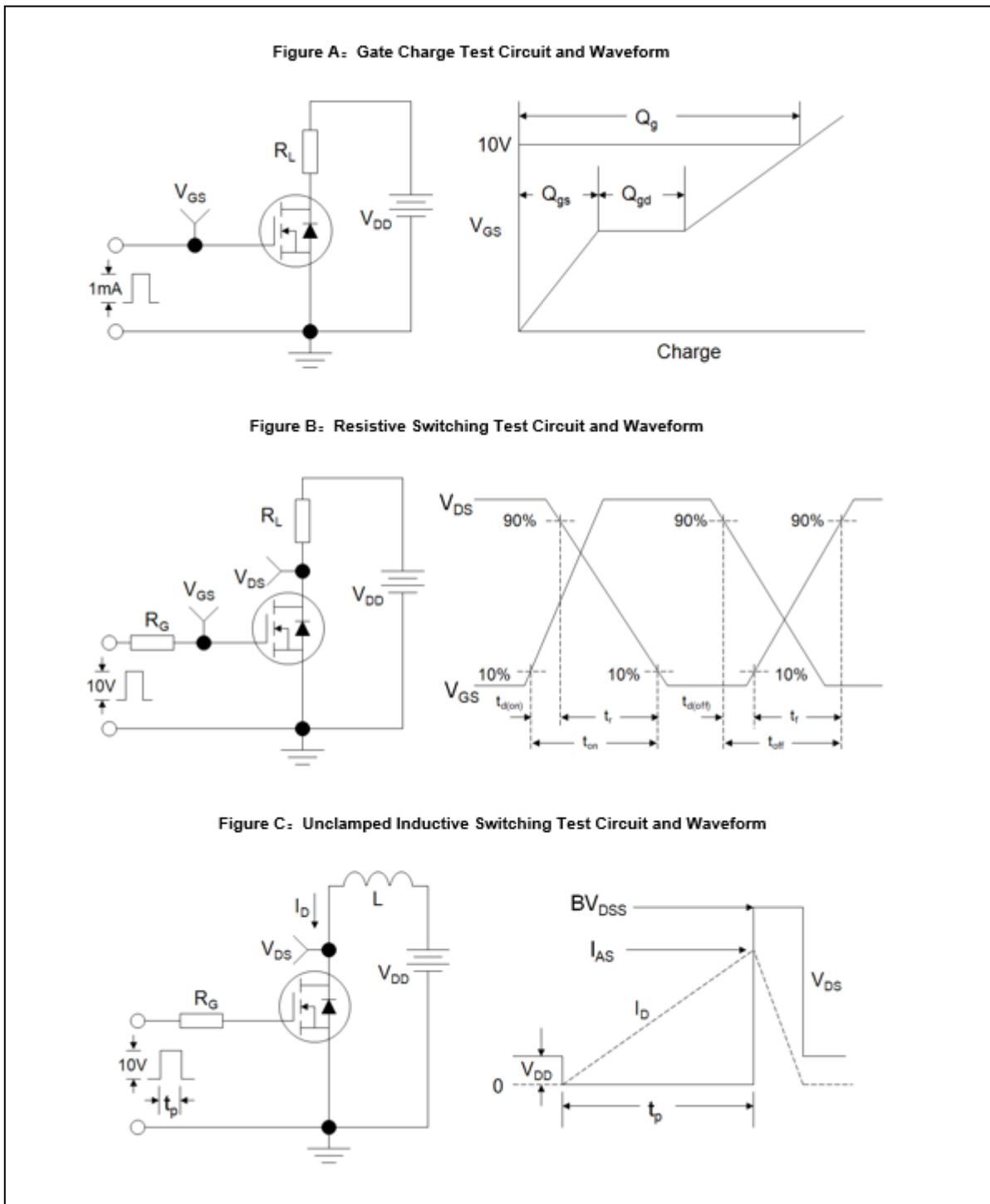
Thermal Characteristics

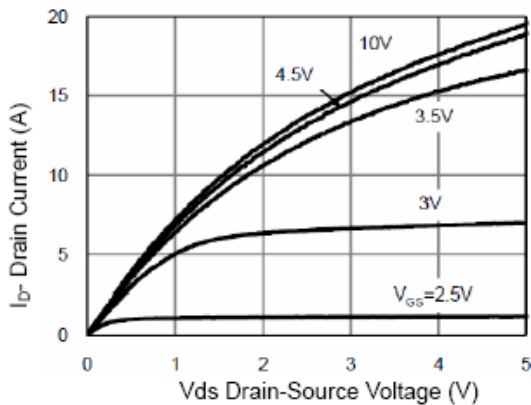
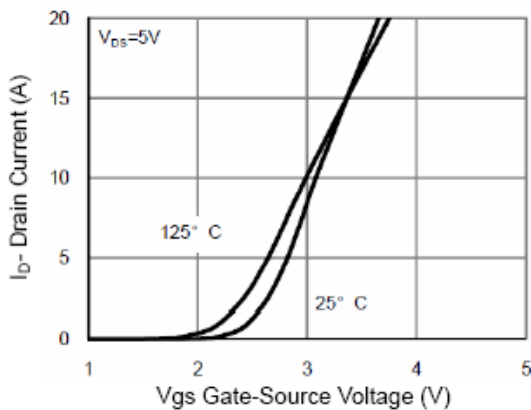
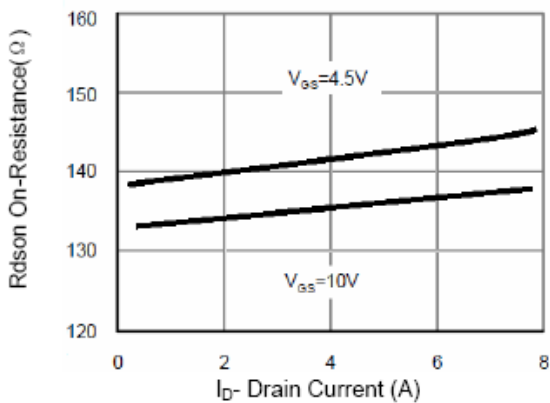
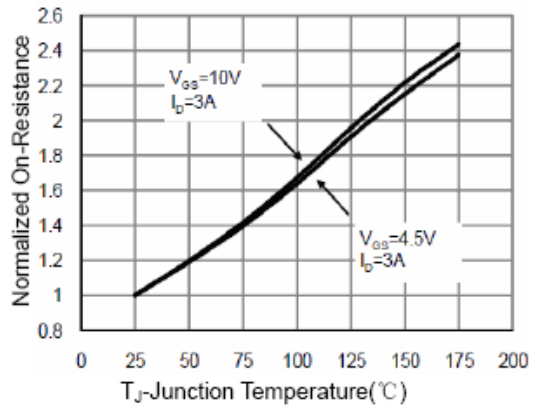
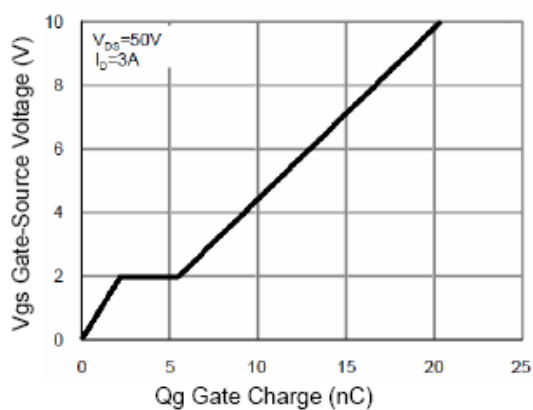
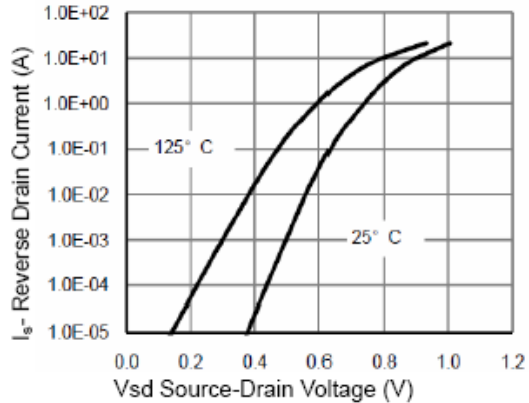
Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case	4.5	$^\circ C/W$
$R_{\theta JA}$	Junction-to-Ambient	83	$^\circ C/W$

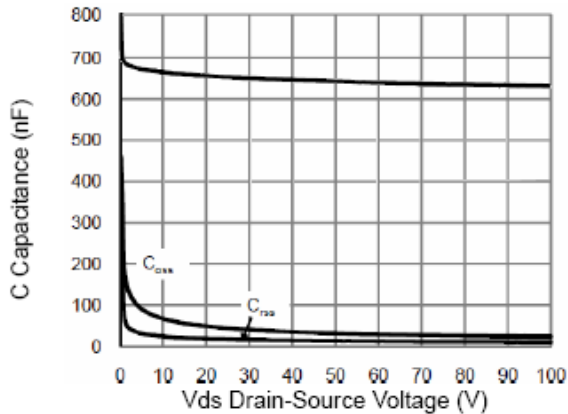
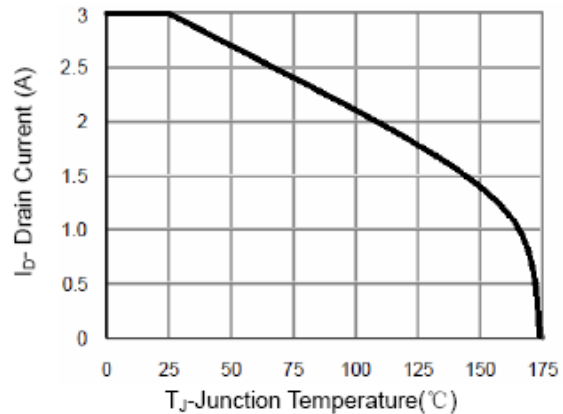
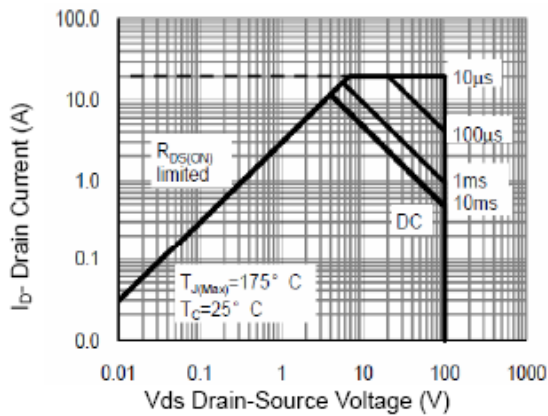
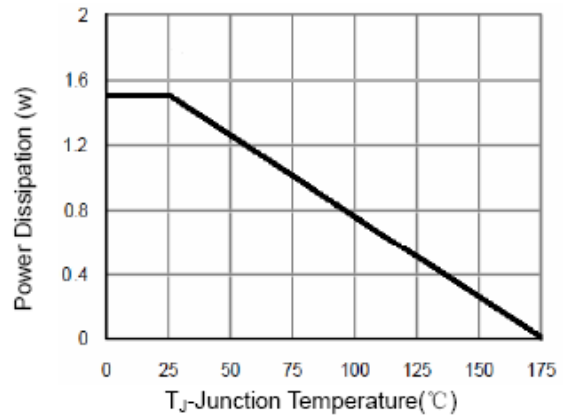
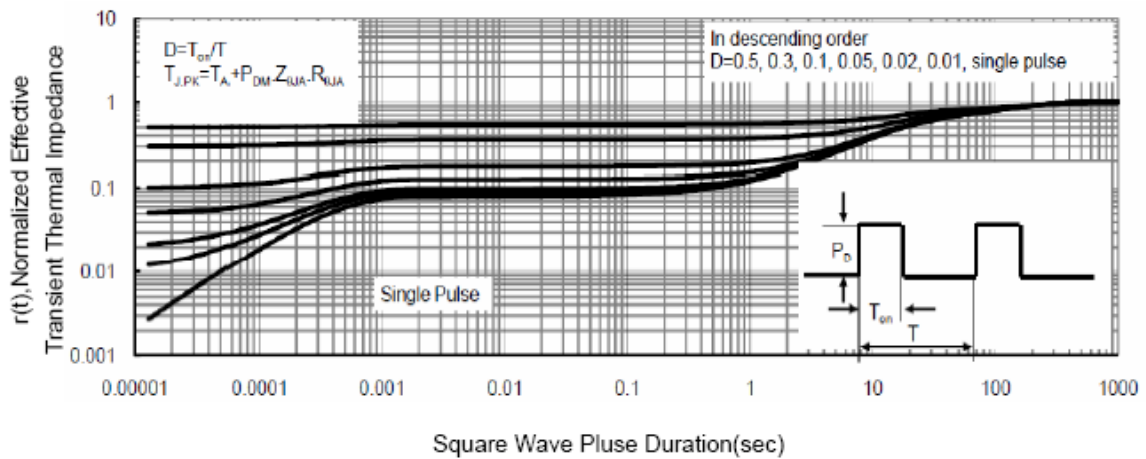
^{a1}: Repetitive rating; pulse width limited by maximum junction temperature

^{a2}: $L=10.0mH, I_D=0.5A, Start T_j=25^\circ C$

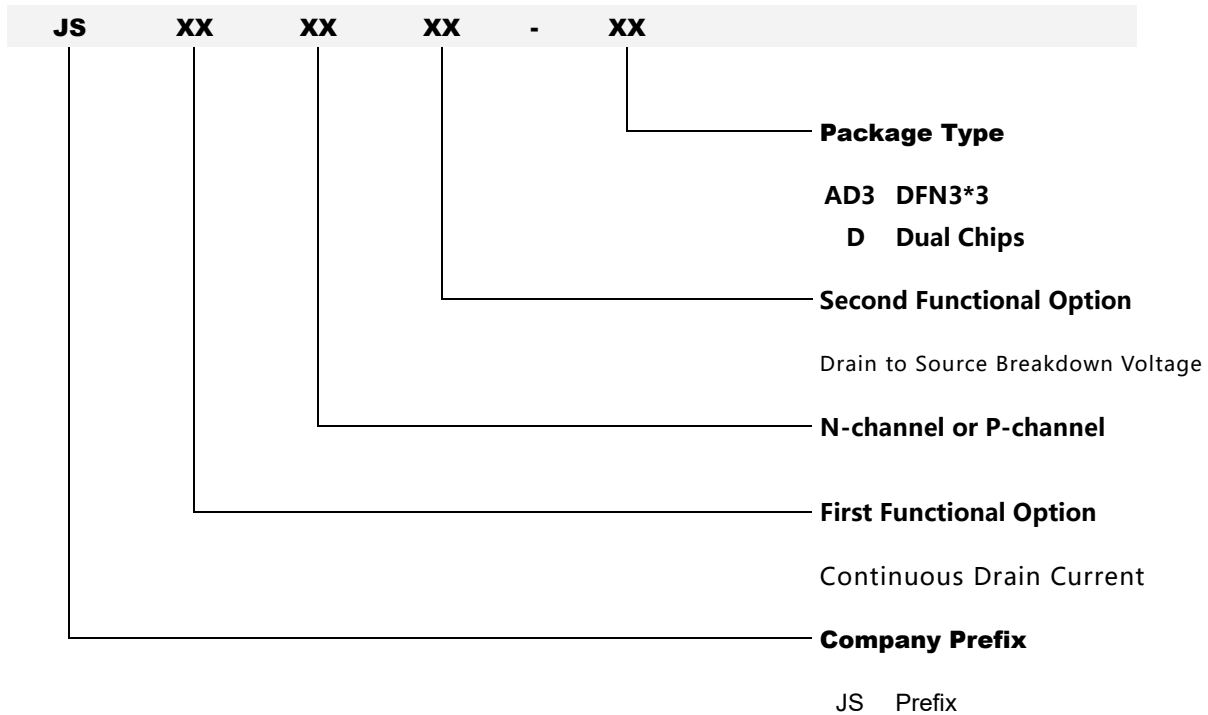
^{a3}: $I_{SD} = 3A, di/dt \leq 100A/us, V_{DD} \leq BV_{DS}, Start T_j=25^\circ C$

Test Circuit and Waveform


Typical Electrical and Thermal Characteristics (Curves)

Figure 1 Output Characteristics

Figure 2 Transfer Characteristics

Figure 3 Rds(on)- Drain Current

Figure 4 Rds(on)-Junction Temperature

Figure 5 Gate Charge

Figure 6 Source- Drain Diode Forward

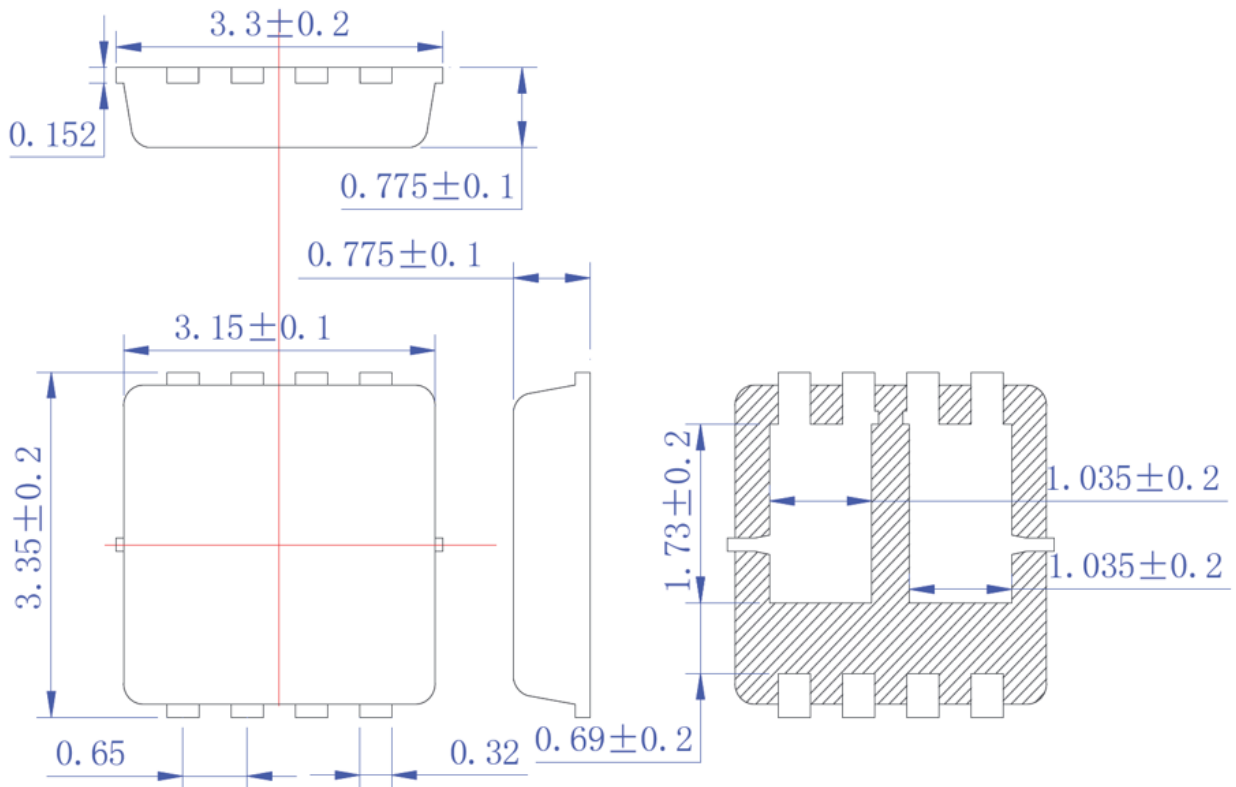

Figure 7 Capacitance vs Vds

Figure 9 BV_{DSS} vs Junction Temperature

Figure 8 Safe Operation Area

Figure 10 Power De-rating

Figure 11 Normalized Maximum Transient Thermal Impedance

Marking Information



	Part NO.	NO.
●	Y	M W SN
Part NO.	JS3N10AD3D	
●	Pin 1 Indicator	
Lot NO.	Y: Year; M: Month; W: Week; SN: Pipeline Code	

Package Information



Revision History

Revision	Date	Descriptions
REV.1.2	Dec., 2018	"Add Marking Information and Package Information" Update
REV.1.1	Aug., 2018	"Typical Performance Characteristics" Update
REV.1.0	July, 2017	Initial Version