

P-Channel Enhancement Mode MOSFET with Schottky Diode

DESCRIPTION

The STC5853 is the P-Channel logic enhancement mode power field effect transistor is produced using high cell density, advanced trench technology to provide excellent $R_{DS(ON)}$.

This high density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application, and low in-line power loss are needed in a very small outline surface mount package.

FEATURE

MOSFET

- ◆ $-20V/-3.5A$, $R_{DS(ON)} = 70m\Omega @ V_{GS} = -4.5V$
- ◆ $-20V/-2.4A$, $R_{DS(ON)} = 95m\Omega @ V_{GS} = -2.5V$
- ◆ $-20V/-1.8A$, $R_{DS(ON)} = 125m\Omega @ V_{GS} = -1.8V$

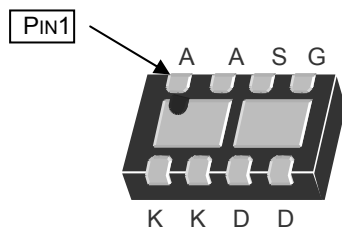
SCHOTTKY

- ◆ $V_{KA} = 20V$, $V_F = 0.43V(Typ.) @ I_F = 1A$
- ◆ Full RoHS compliance
- ◆ DFN3X2-8L package design

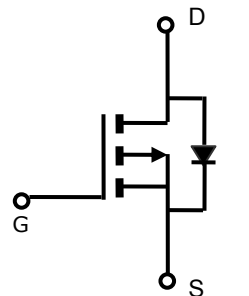
APPLICATIONS

- ◆ Battery Powered System
- ◆ Notebook Power Management
- ◆ Cell Phone

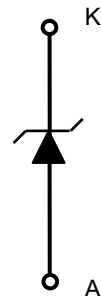
PIN CONFIGURATION



TOP VIEW
DFN3X2-8L



P-Channel Mosfet



Schottky Diode

PART NUMBER INFORMATION

STC5853XX-XX X

Lead Plating Code

Handling Code

Package Code

Lead Plating Code

G : Lead-free product.

This product is RoHS compliant

Handling Code

TR : Tape&Reel

Package Code

DF : DFN3X2-8L

ORDERING INFORMATION

Part Number	Package Code	Package	Shipping
STC5853DF-TRG	DF	DFN3X2-8L	3000 /Tape&Reel

※ Year Code : 0 ~ 9

※ Week Code : A ~ Z(1~26) ; a ~ z(27~52)

※ DFN3X2-8L : Only available in tape and reel packaging. (A reel contains 3000 devices)

※ G : Lead-free product. This product is RoHS compliant

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ Unless otherwise noted)

Symbol	Parameter	Typical	Unit
P-Channel MOSFET			
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current ($T_J=150^\circ\text{C}$)	$T_A=25^\circ\text{C}$ -3.5 $T_A=70^\circ\text{C}$ -2.8	A
I_{DM}	Pulsed Drain Current	-15	A
I_S	Continuous Source Current (Diode Conduction)	-1.4	A
T_J	Operation Junction Temperature	-55~150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55~150	W
P_D	Power Dissipation	$T_A=25^\circ\text{C}$ 1.25 $T_A=70^\circ\text{C}$ 0.8	W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	$T \leq 10\text{sec}$ 65 Steady State 95	$^\circ\text{C/W}$
Schottky			
V_{KA}	Reverse Voltage	20	V
I_F	Continuous Drain Current	$T_A=25^\circ\text{C}$ 1 $T_A=70^\circ\text{C}$ 0.7	A
I_{FM}	Pulsed Drain Current	10	A
P_D	Power Dissipation	$T_A=25^\circ\text{C}$ 0.9 $T_A=70^\circ\text{C}$ 0.6	W

Note: 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.

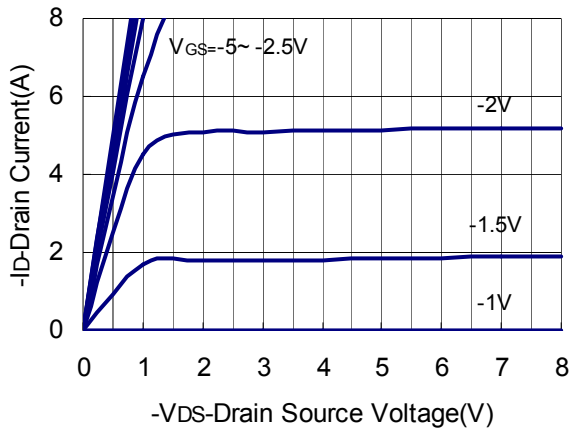
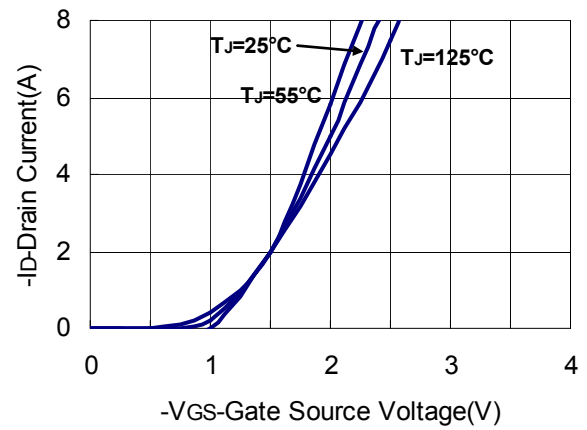
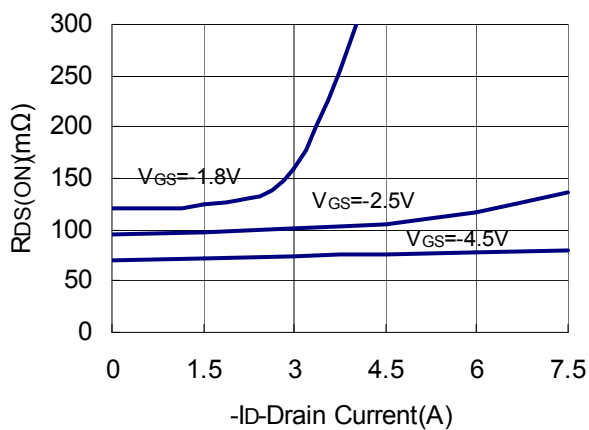
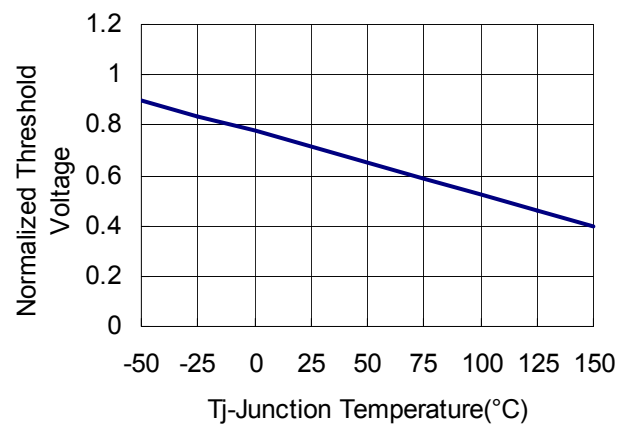
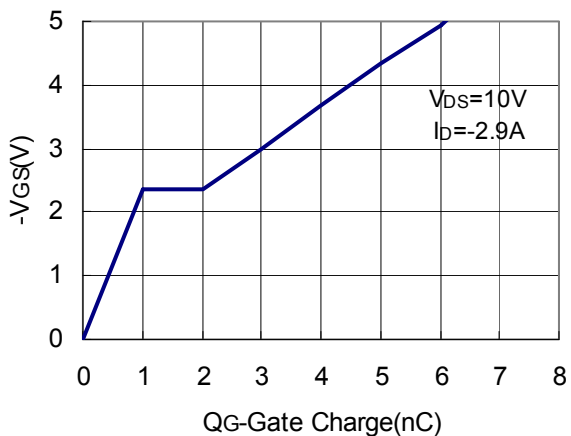
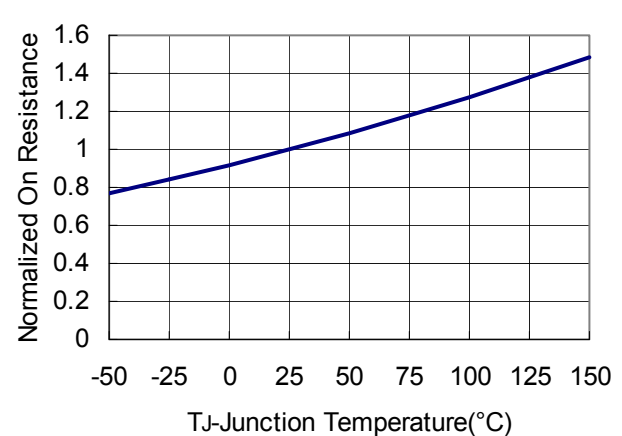
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ Unless otherwise noted)

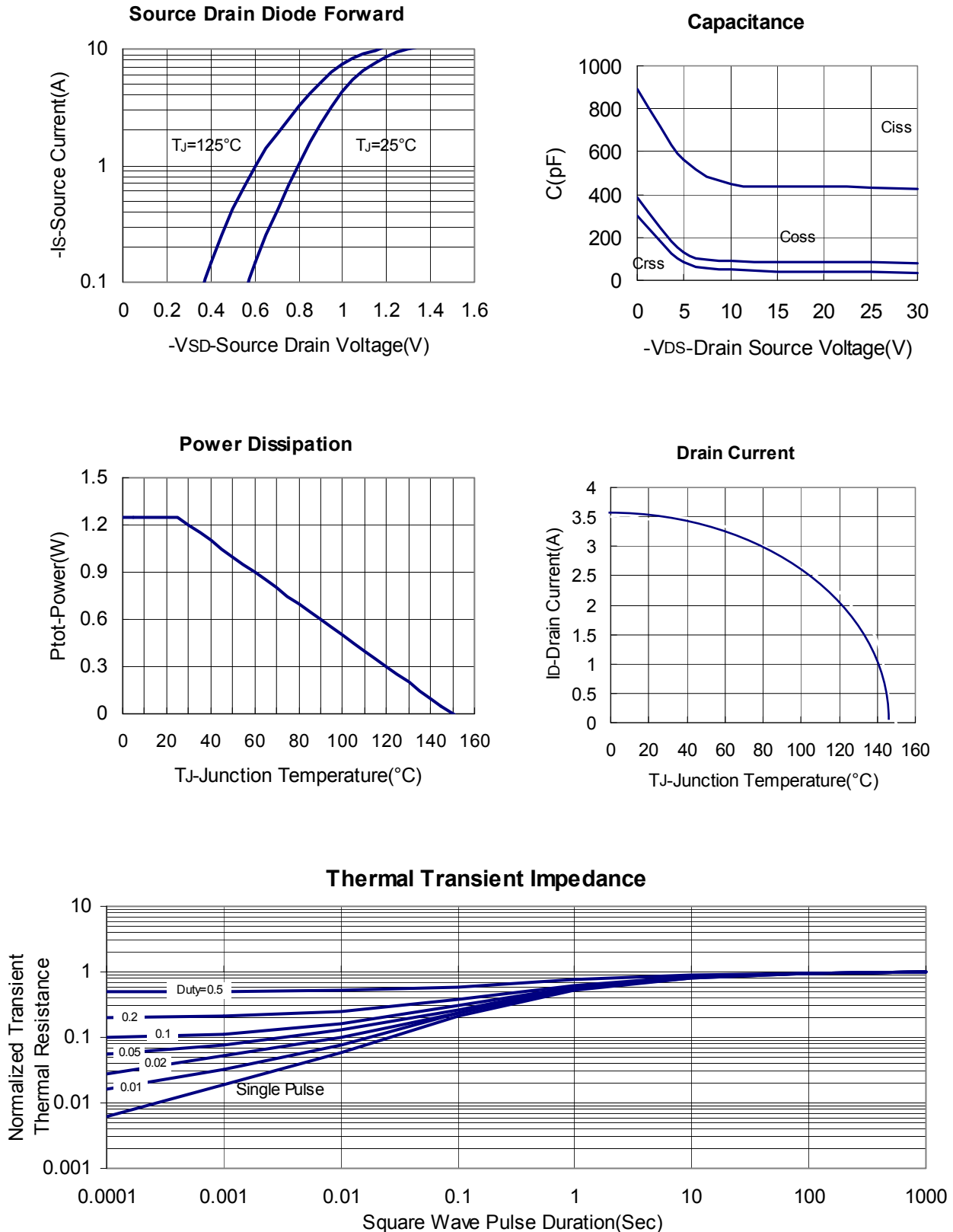
Symbol	Parameter	Condition	Min	Typ	Max	Unit
MOSFET Dynamic Parameters						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	-20			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.4		-0.9	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±12V			±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V			-1	μA
		V _{DS} =-20V, V _{GS} =0V T _J =55℃			-5	
R _{DS(ON)}	Drain-source On-Resistance	V _{GS} =-4.5V, I _D =-3.5A V _{GS} =-2.5V, I _D =-2.4A V _{GS} =-1.8V, I _D =-1.8A		70 95 125	80 110 140	mΩ
G _{fs}	Forward Transconductance	V _{DS} =-5V, I _D =-2.8A		6		S
MOSFET Dynamic Parameters						
Q _g	Total Gate Charge	V _{DS} =-6V, V _{GS} =-4.5V I _D =-2.8A		4.8	8	nC
Q _{gs}	Gate-Source Charge			1.0		
Q _{gd}	Gate-Drain Charge			1.0		
C _{iss}	Input Capacitance	V _{DS} =-6V, V _{GS} =0V f =1MHz		485		pF
C _{oss}	Output Capacitance			85		
C _{rss}	Reverse Transfer Capacitance			40		
t _{d(on)}	Turn-On Time	V _{DD} =-6V, R _L =6Ω I _D =-1.0A, V _{GEN} =-4.5V R _G =6Ω		10	16	nS
t _r				13	23	
t _{d(off)}	Turn-Off Time			18	25	
t _f				15	20	

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ Unless otherwise noted)

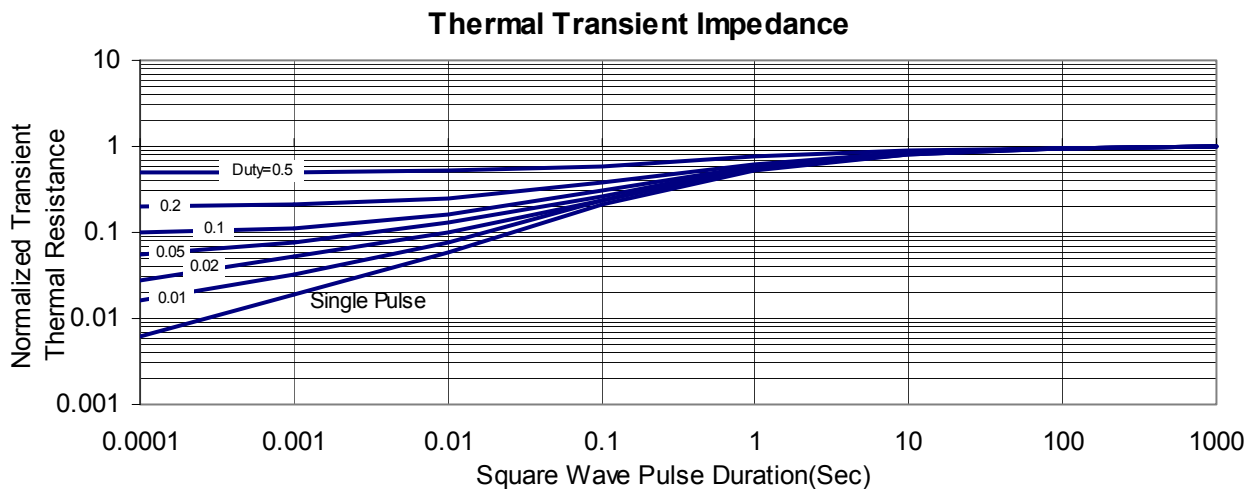
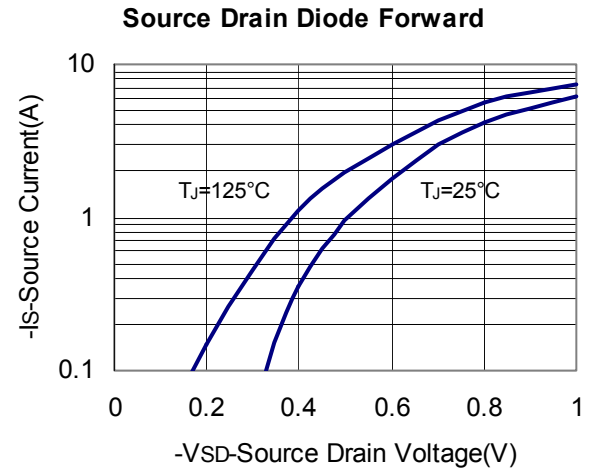
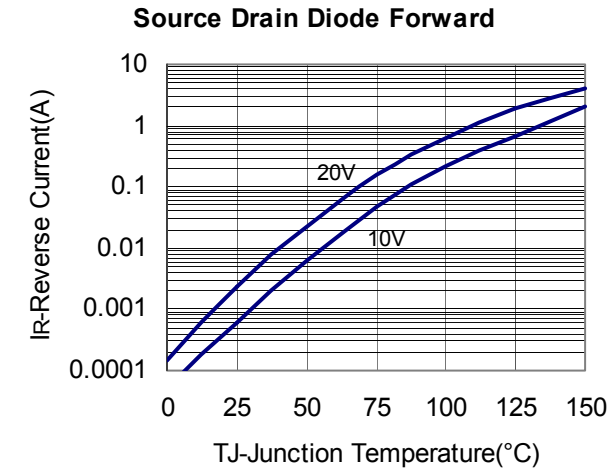
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Schottky Parameters						
V_F	Forward Voltage Drop	$I_F = 1A$		0.43	0.47	V
V_{BR}	Reverse Breakdown Voltage	$I_R = 500\mu A$	20			V
I_{rm}	Maximum reverse leakage current	$V_R = 23V$ $V_R = 23V, T_J = 70^\circ\text{C}$			0.1 1	mA
C_T	Junction Capacitance	$V_R = 10V$ $V_R = 0V, f = 1\text{MHz}$		31 120		pF
T_{rr}	Schottky Reverse Recovery Time	$I_F = 1A, dI/dt = 100A/\mu s$		5.4	10	nS
Q_{rr}	Schottky Reverse Recovery Charge	$I_F = 1A, dI/dt = 100A/\mu s$		0.8		nC

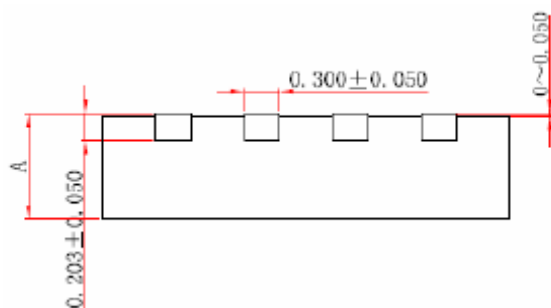
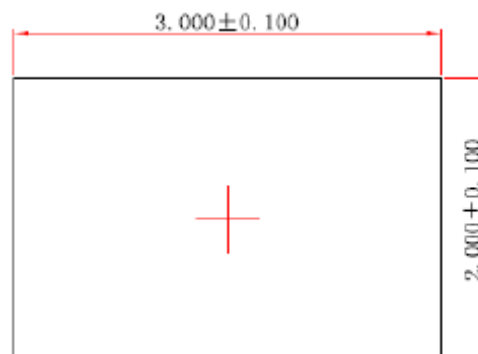
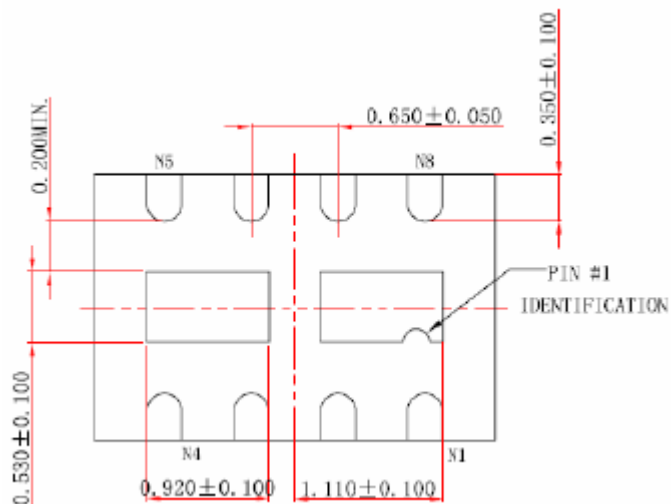
TYPICAL CHARACTERISTICS (MOSFET)

Output Characteristics

Transfer Characteristics

Drain Source On Resistance

Gate Threshold Voltage

Gate Charge

Drain Source On Resistance


TYPICAL CHARACTERISTICS (MOSFET)


TYPICAL CHARACTERISTICS (Schottky)



DFN3x2-8L PACKAGE DIMENSIONS


	MIN.	MORM.	MAX.
A	0.700	0.750	0.800
	0.800	0.850	0.900