

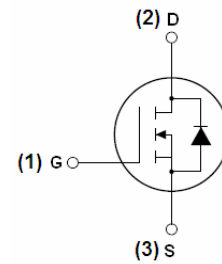
FNK N-Channel Enhancement Mode Power MOSFET

Description

The FNK03N07F uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

General Features

- $V_{DS} = 30V, I_D = 75A$
 $R_{DS(ON)} < 7.0m\Omega @ V_{GS} = 10V$
 $R_{DS(ON)} < 11m\Omega @ V_{GS} = 4.5V$
- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation
- Low $R_{DS(ON)}$



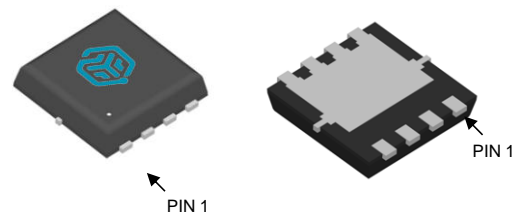
Schematic diagram



Marking and pin assignment

Application

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



Top View

Bottom View

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
03N07F	FNK03N07F	DFN3.3*3.3	-	-	-

Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	75	A
Drain Current-Continuous($T_C = 100^\circ C$)	$I_D (100^\circ C)$	50	A
Pulsed Drain Current	I_{DM}	300	A
Maximum Power Dissipation	P_D	83	W
Derating factor		0.56	W/ $^\circ C$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 175	$^\circ C$

Thermal Characteristic

Thermal Resistance, Junction-to-Case ^(Note 2)	$R_{\theta JC}$	1.8	°C/W
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Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

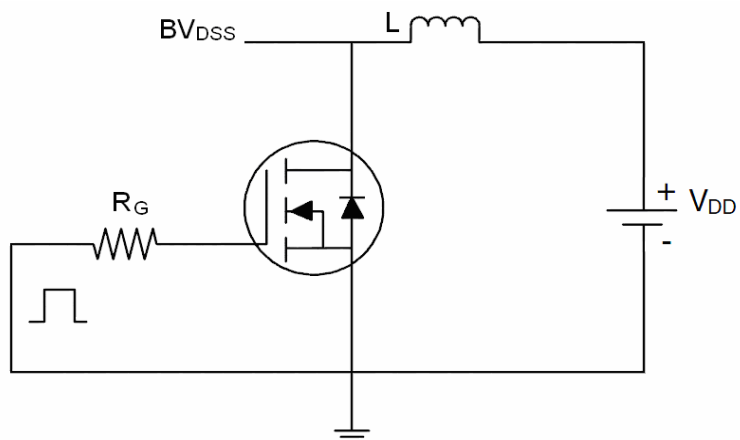
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250μA	30	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics ^(Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.4	2.2	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =15A	-	5.8	7.0	mΩ
		V _{GS} =4.5V, I _D =10A	-	9.8	11	
		V _{GS} =3.3V, I _D =5A		19.0	26	
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =24A	20	-	-	S
Dynamic Characteristics ^(Note4)						
Input Capacitance	C _{ISS}	V _{DS} =15V, V _{GS} =0V, F=1.0MHz	-	830	-	PF
Output Capacitance	C _{OSS}		-	220	-	PF
Reverse Transfer Capacitance	C _{rss}		-	180	-	PF
Switching Characteristics ^(Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =10V, I _D =30A V _{GS} =10V, R _{GEN} =2.7Ω	-	6	-	nS
Turn-on Rise Time	t _r		-	4	-	nS
Turn-Off Delay Time	t _{d(off)}		-	18	-	nS
Turn-Off Fall Time	t _f		-	5	-	nS
Total Gate Charge	Q _g	V _{DS} =10V, I _D =30A, V _{GS} =10V	-	45	-	nC
Gate-Source Charge	Q _{gs}		-	12	-	nC
Gate-Drain Charge	Q _{gd}		-	8	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 3)	V _{SD}	V _{GS} =0V, I _S =24A	-	-	1.2	V
Diode Forward Current ^(Note 2)	I _S		-	-	80	A
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F = 80A di/dt = 100A/μs ^(Note3)	-	22	50	nS
Reverse Recovery Charge	Q _{rr}		-	12	20	nC

Notes:

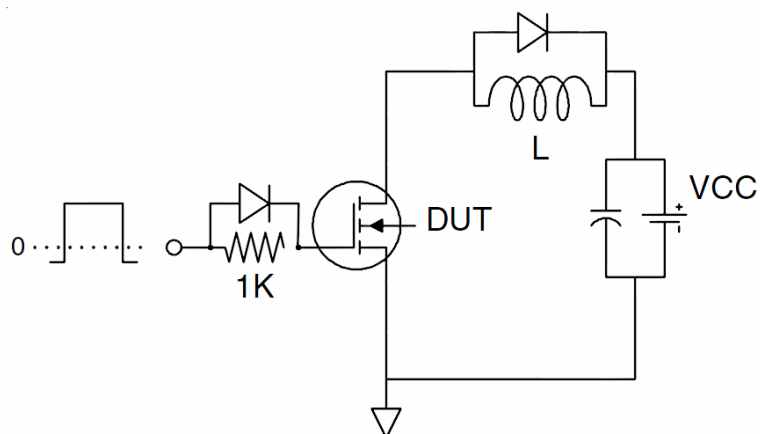
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

Test Circuit

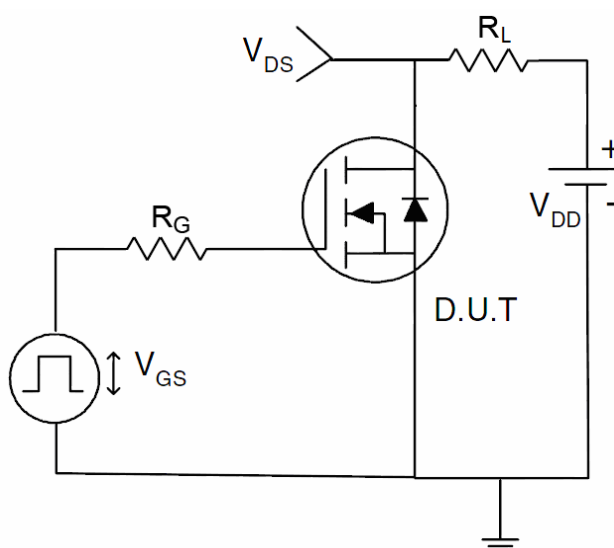
1) E_{AS} Test Circuits



2) Gate Charge Test Circuit:



3) Switch Time Test Circuit:



Typical Electrical and Thermal Characteristics (Curves)

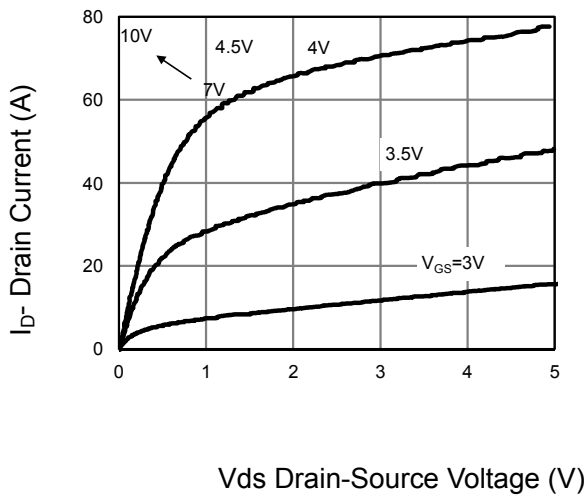


Figure 1 Output Characteristics

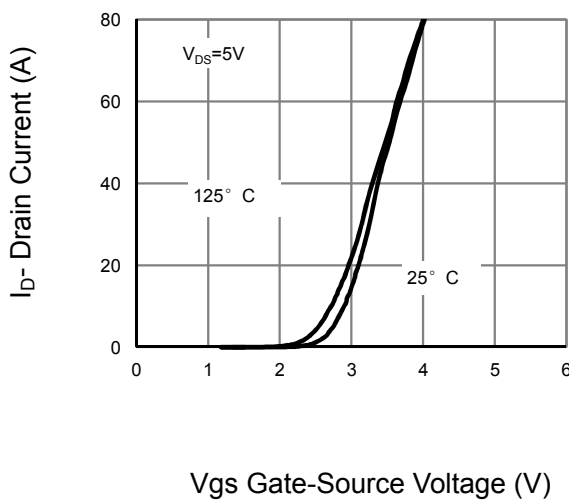


Figure 2 Transfer Characteristics

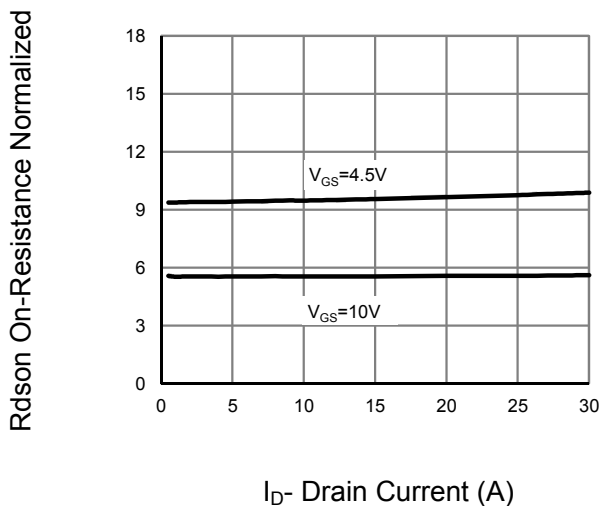


Figure 3 R_{dson} - Drain Current

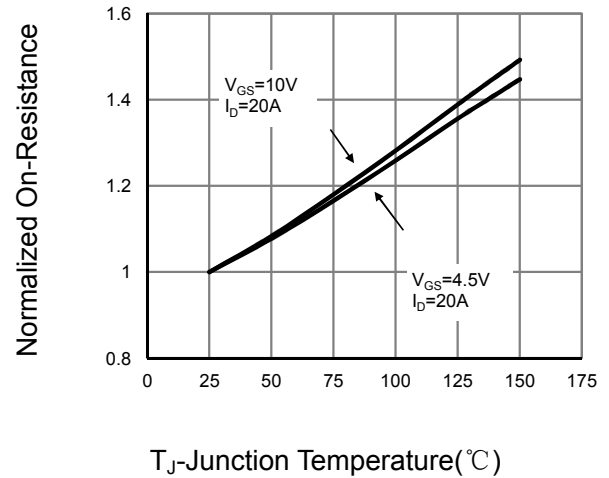


Figure 4 R_{dson} -Junction Temperature

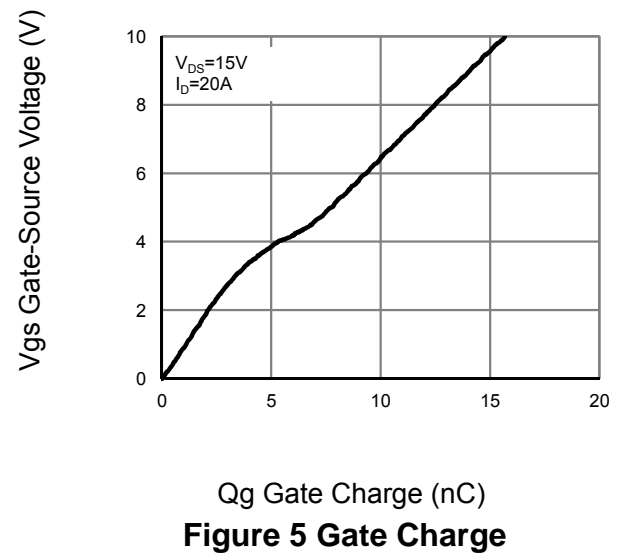


Figure 5 Gate Charge

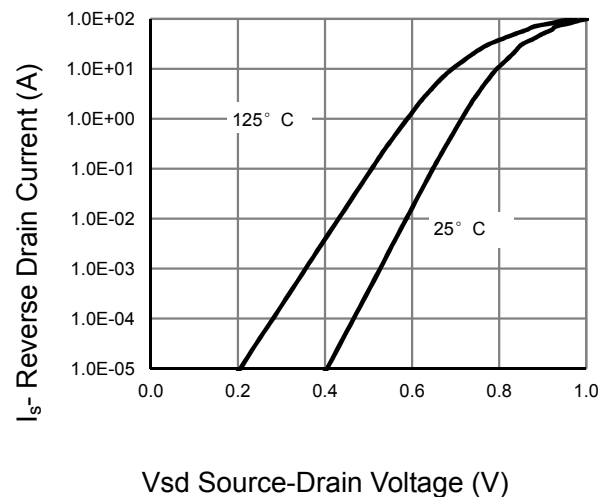
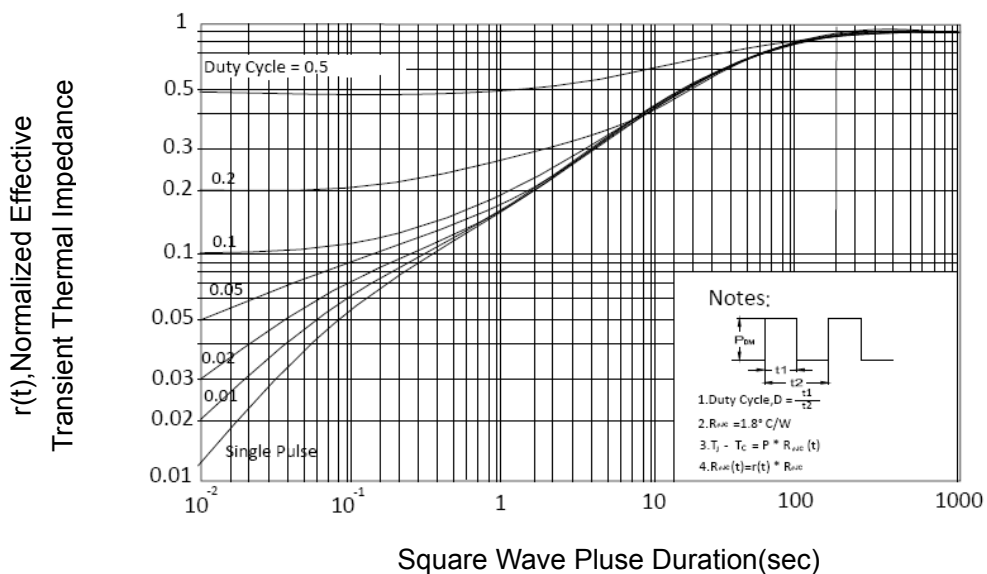
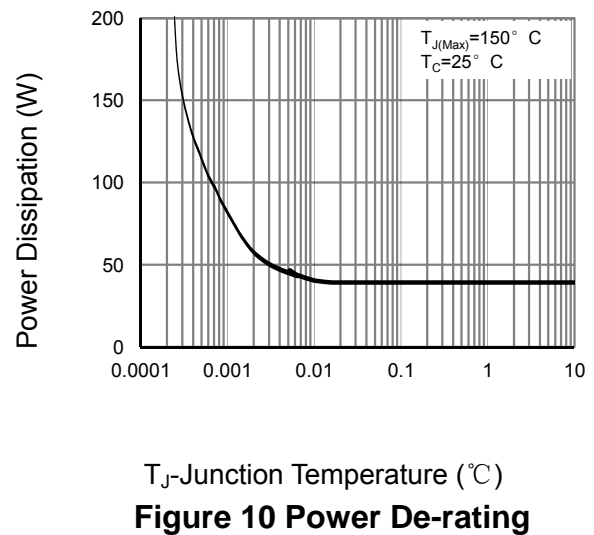
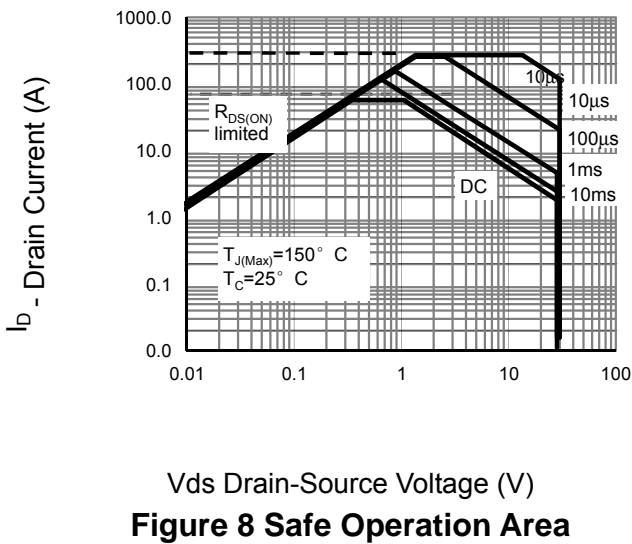
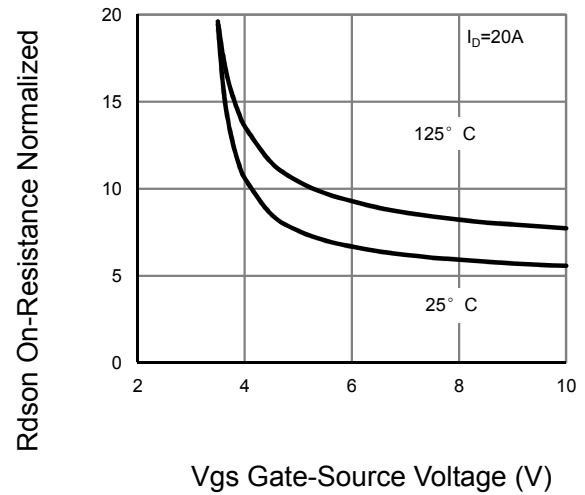
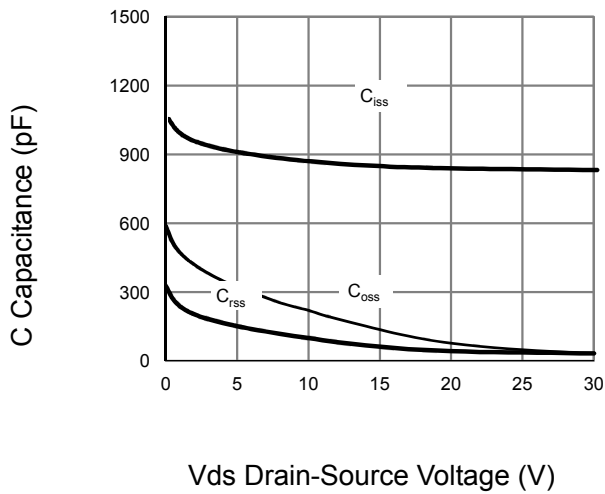
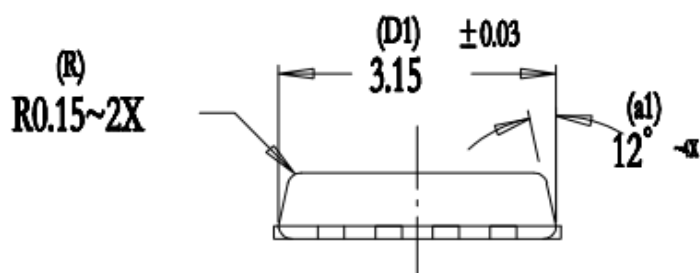
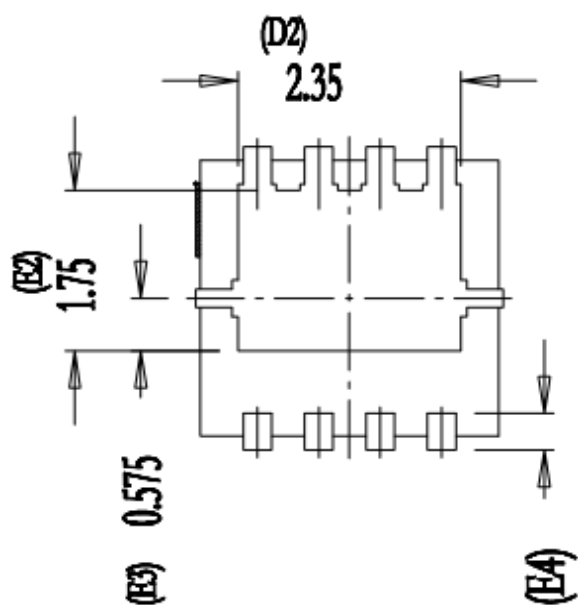
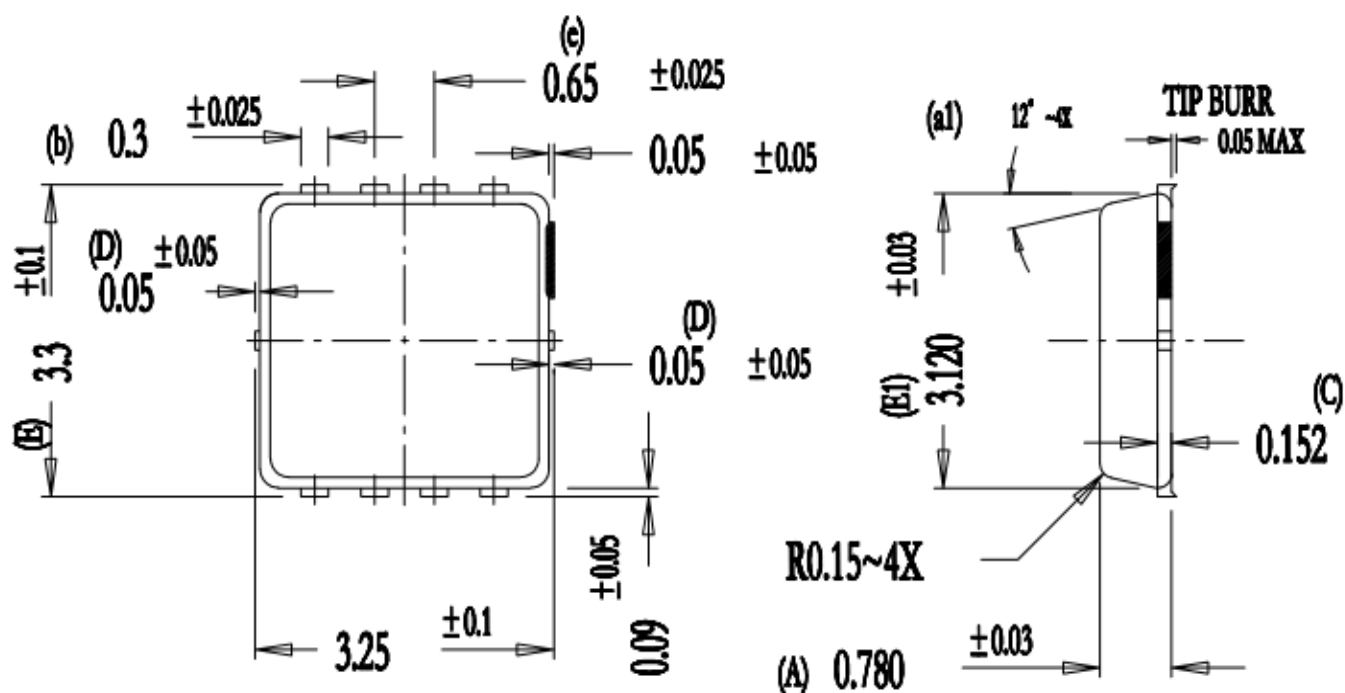


Figure 6 Source- Drain Diode Forward



DFN3.3* 3.3 Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.75	0.78	0.81
A1		—	
b	0.297	0.3	0.35
c	—	0.152	—
D	0.00	0.05	0.1
D1	3.12	3.15	3.18
D2	—	2.35	—
E	3.2	3.3	3.4
E1	3.09	3.12	3.15
E2	—	1.75	—
E3	—	0.575	—
E4			
R	—	0.15	—
e	0.65BSC		
11'	—	12'	—

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