VFSB010R33ANA

Datasheet

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
100V	330mΩ@10V	2.3A
	450mΩ@4.5V	

Symbol

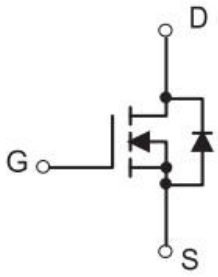

Figure 1 Symbol of VFSB010R33ANA

Features

- High Power and Current Handing Capability
- Lead Free Product is Acquired
- Surface Mount Package

Package Type

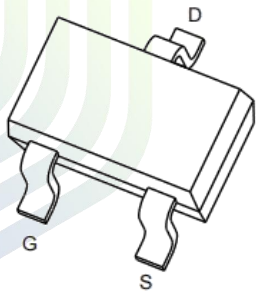

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Figure 2 Package Type of VFSB010R33ANA

Application

- PWM Application
- Load Switch
- Power Management

Ordering Information

Product Name	Package
VFSB010R33ANA	SOT-23

Absolute Maximum Ratings (T_C= 25 ºC, unless otherwise specified)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current Note5	T_C= 25 ºC	I_D	2.3	A
Continuous Drain Current Note5	T_C= 100 ºC		1.5	A
Pulsed Drain Current Note3		I_{DM}	8	A
Total Power Dissipation Note2	T_C= 25 ºC	P_D	3	W
Junction Temperature		T_J	150	ºC
Storage Temperature		T_{STG}	-55 to 150	ºC

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Ambient Note1,4	$R_{\theta JA}$		85		ºC/W

Electrical Characteristics (T_C= 25 ºC, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D= 250uA	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= 80V, V_{GS}=0V	-	-	1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS}= 0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	0.8	1.2	1.6	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D= 2A	-	230	330	mΩ
		V_{GS}= 4.5V, I_D= 1A	-	280	450	
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=15V	-	112	-	pF
Output Capacitance	C_{OSS}	V_{GS}=0V	-	39	-	pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz	-	1.2	-	pF
Total Gate charge	Q_g	V_{DS}=50V	-	2.5	-	nC
Gate-source charge	Q_{gs}	V_{GS}=10V	-	0.8	-	
Gate-drain charge	Q_{gd}	I_D= 2A	-	0.55	-	
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= 50V	-	9.1	-	ns
Turn-on Rise Time	t_r	V_{GS}= 10V	-	1.8	-	
Turn-off Delay Time	$t_{d(off)}$	I_D= 2A	-	8.3	-	
Turn-off Fall Time	t_f	R_G=2Ω	-	7.6	-	
Source - Drain Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, I_{SD}= 2A	-	-	1.3	V
Continuous Source Current	Is		-	-	2.3	A
Reverse Recovery Time	Trr	I_{SD}= 3A	-	19	-	ns
Reverse Recovery Charge	Qrr	di/dt=100A/us	-	24	-	nC

Notes :

1. The value of $R_{\theta JC}$ is measured in a still air environment with T_A =25°C and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
2. The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
3. Single pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
4. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to case $R_{\theta JC}$ and case to ambient.
5. The maximum current rating is package limited.

Typical Performance Characteristics

Figure 3: Transfer Characteristics

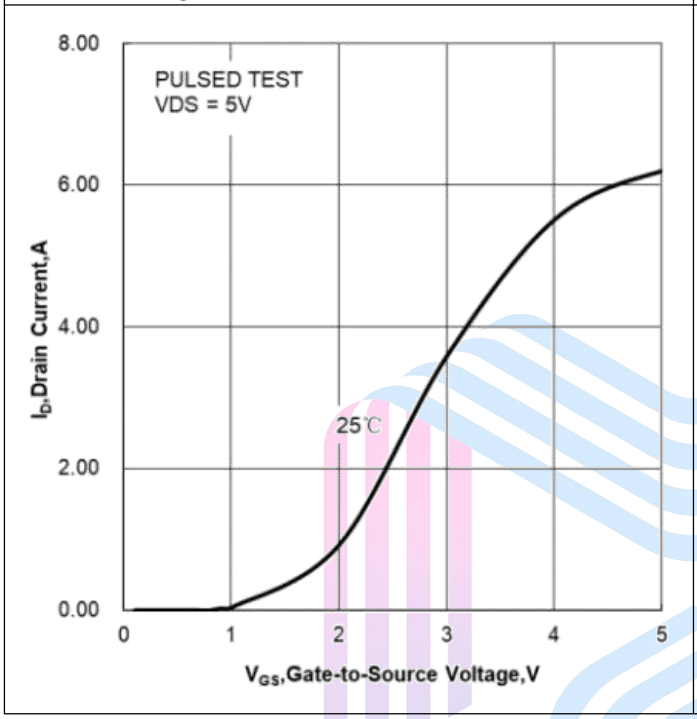


Figure 4: Output Characteristics

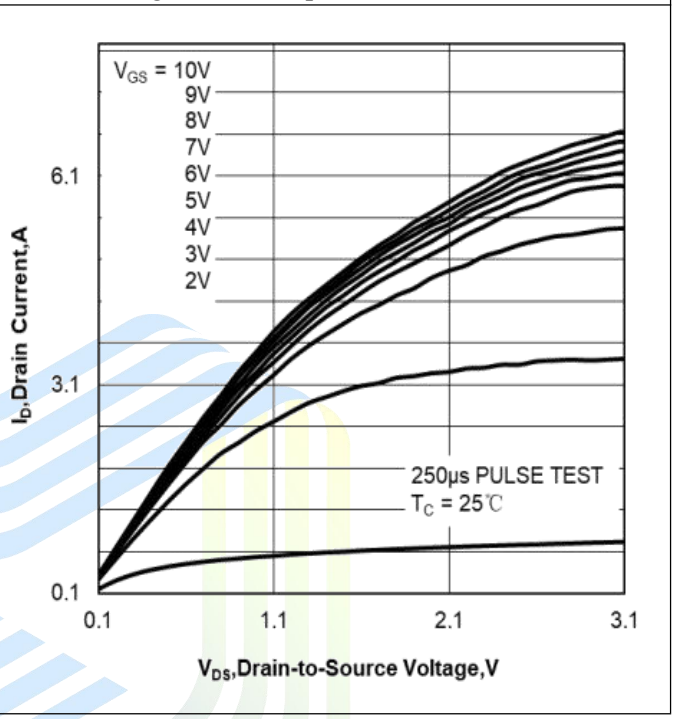


Figure 5: On-Resistance vs. Drain Current

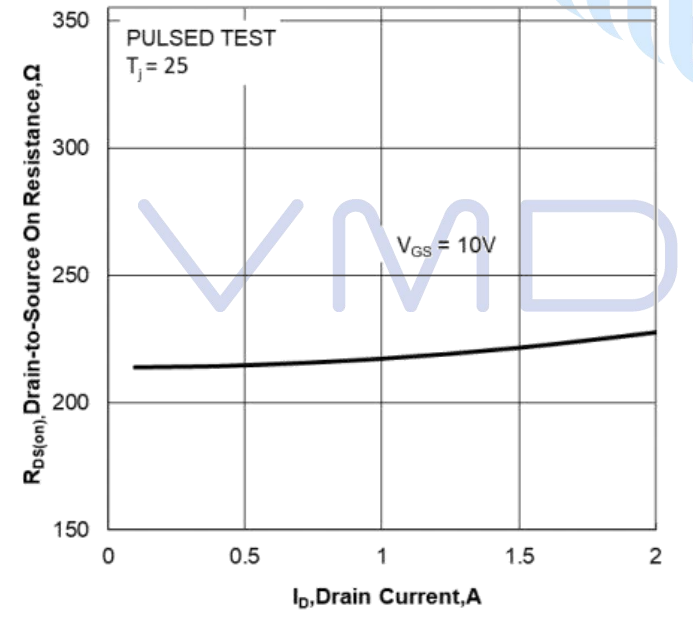


Figure 6: Gate Charge Characteristics

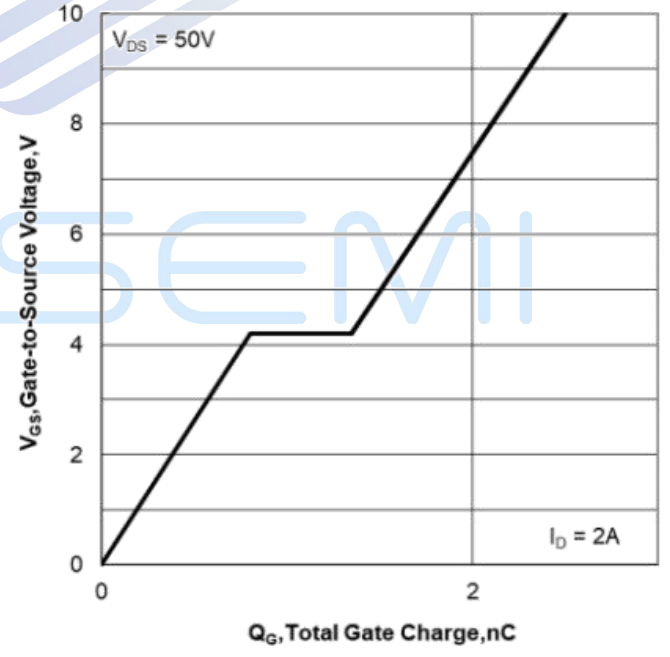


Figure 7: Normalized On Resistance vs Junction Temperature

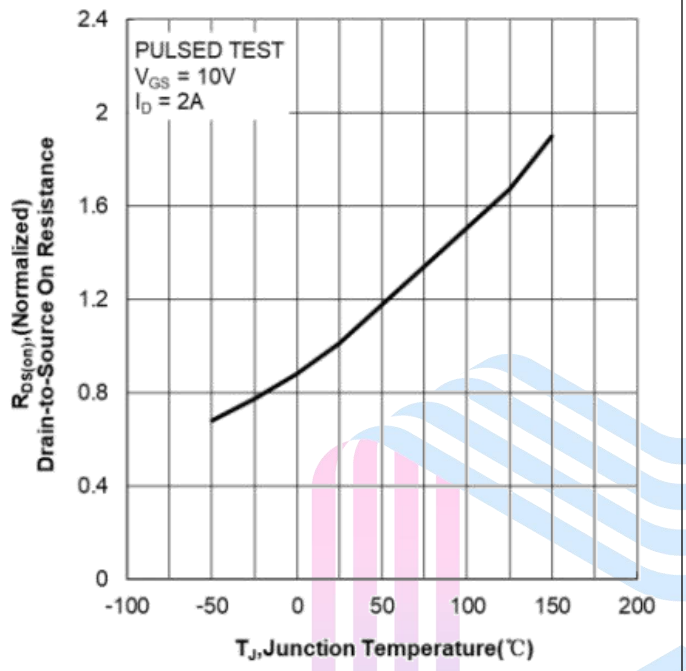


Figure 8: Normalized Breakdown Voltage vs Junction Temperature

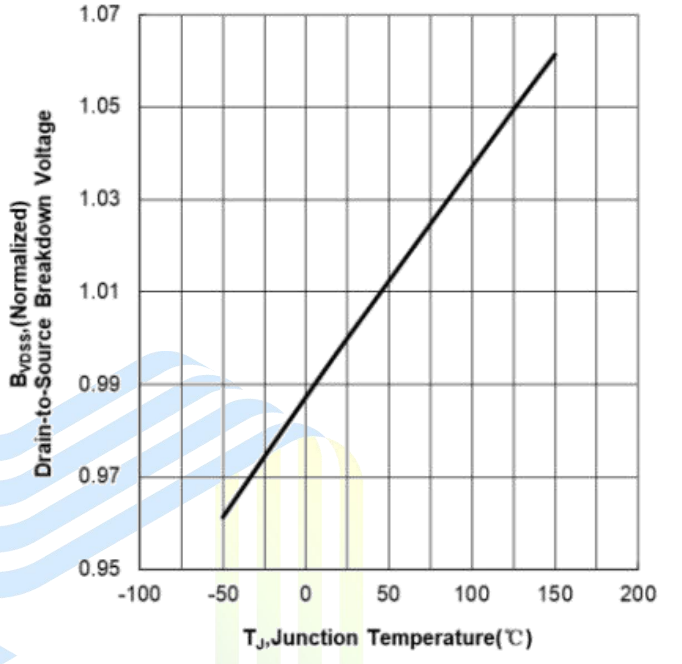


Figure 9: Capacitance Characteristics

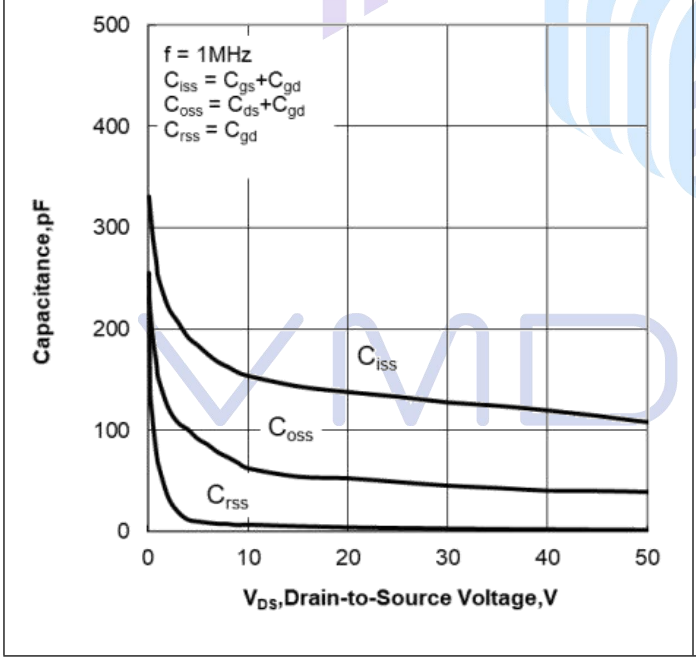


Figure 10: Body Diode Characteristics

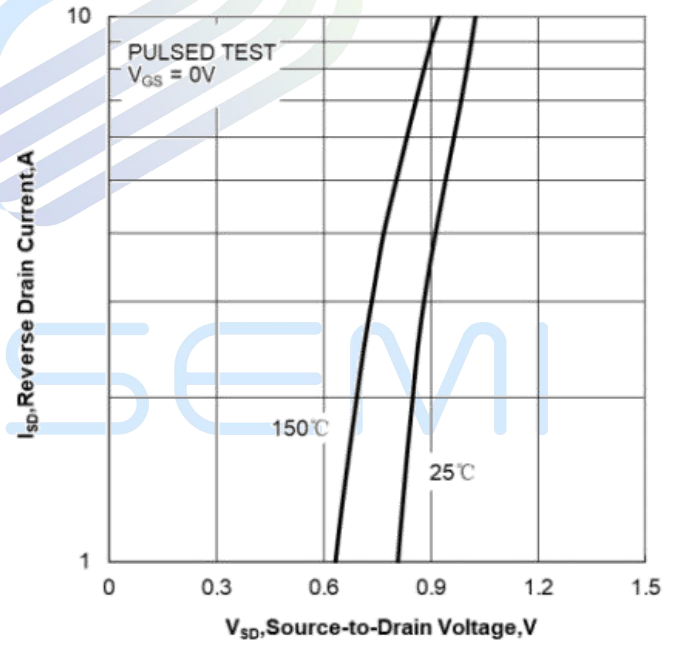


Figure 11: Maximum Continuous Drain Current vs Case Temperature

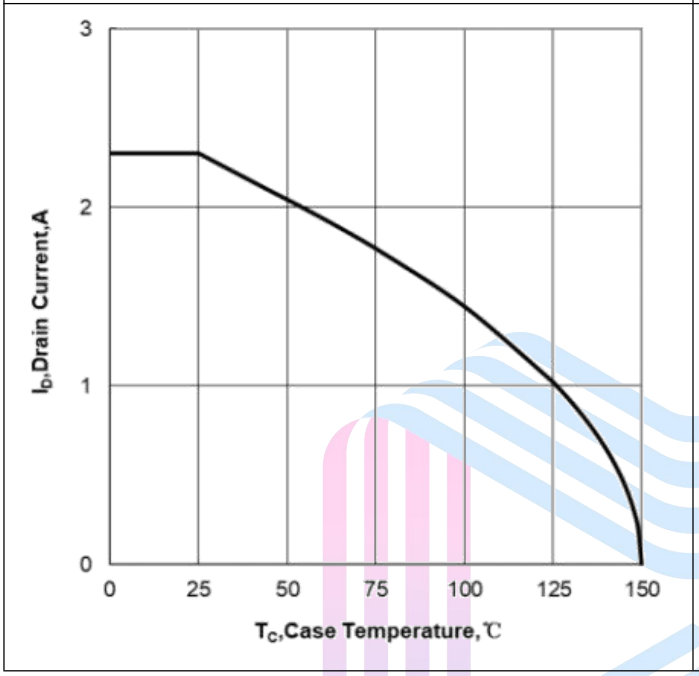


Figure 12: Maximum Power Dissipation vs Case Temperature

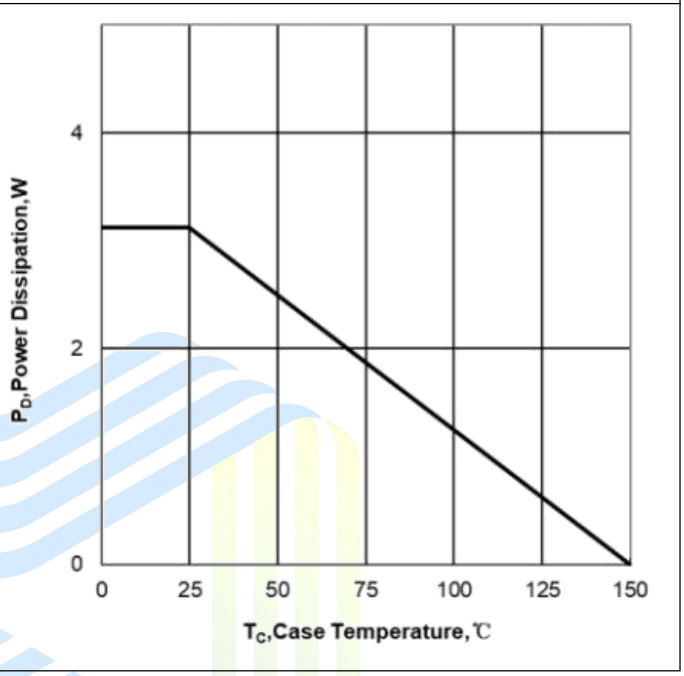


Figure 13: Drain-to-Source On Resistance vs Gate Voltage and Drain Current

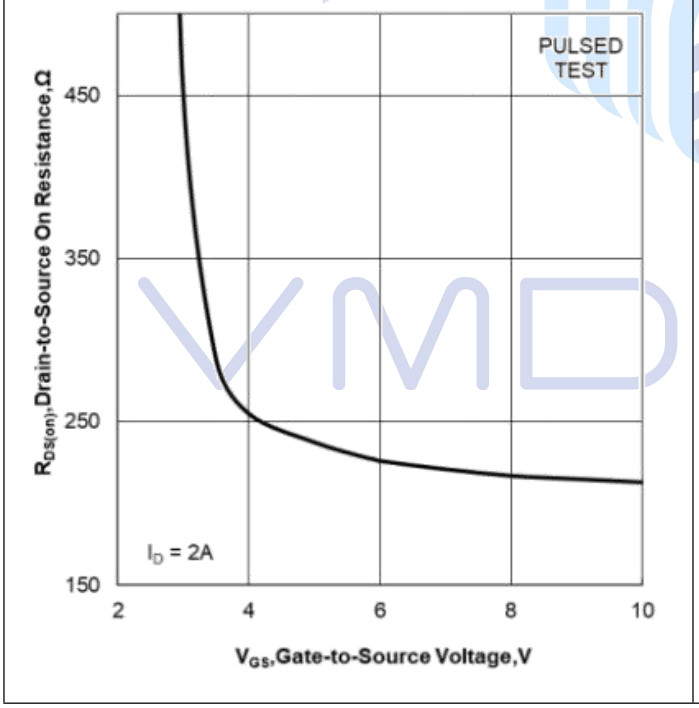
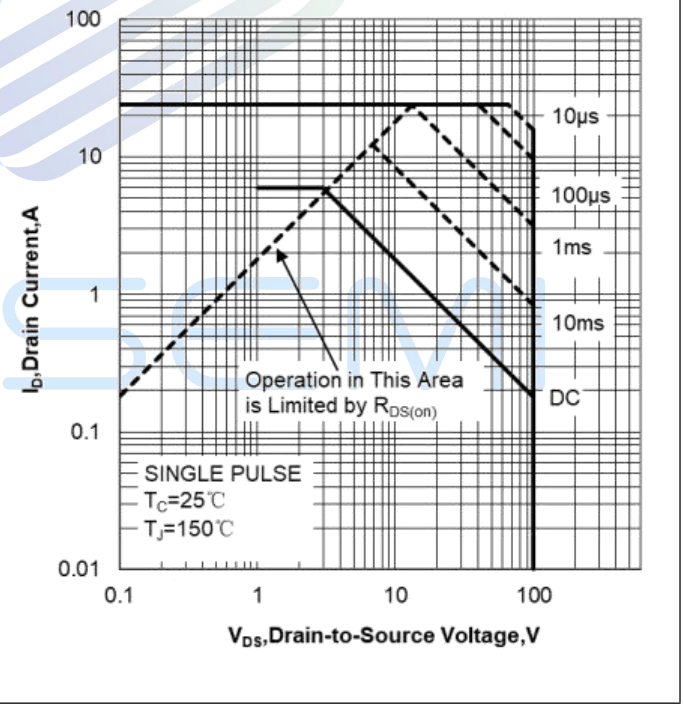
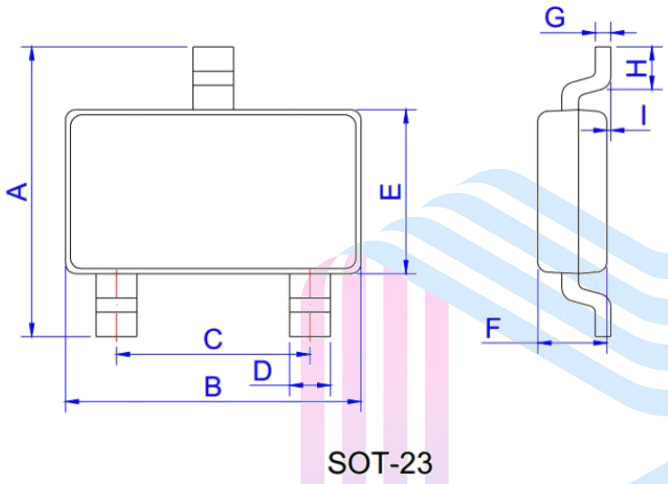


Figure 14: Maximum Safe Operating Area



Mechanical Dimensions:

SOT-23 Package Information



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Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.30	2.40	2.50	0.091	0.095	0.098
B	2.80	2.90	3.00	0.110	0.114	0.118
C	1.90 REF			0.075 REF		
D	0.35	0.40	0.45	0.014	0.016	0.018
E	1.20	1.30	1.40	0.047	0.051	0.055
F	0.90	1.00	1.10	0.035	0.039	0.043
G		0.10	0.15		0.004	0.006
H	0.20			0.008		
I	0		0.10	0		0.004

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