NS120H06F

N-Channel 120V, 6.5mΩ Typ. Power MOSFET

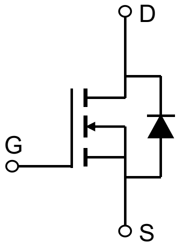
Features

- 120V, 90A

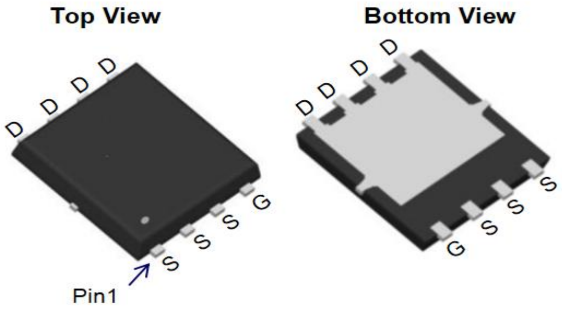
  $R_{DS(ON)}$ Typ = 6.5mΩ @ V_{GS} = 10V
- Advanced Split Gate Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free
- 100% UIS TESTED!
- 100% ΔVds TESTED!

Application

- Load Switch
- PWM Application
- Power Management



Schematic Diagram



PDFN5*6-8L

Package Marking and Ordering Information

Device	Marking	Package		Reel Size	Reel (pcs)	Per Carton (pcs)
NS120H06F	NS120H06F	PDFN5x6-8L	TAPING	13"	5000	50000

Absolute Maximum Ratings (@ T_J = 25°C unless otherwise specified)

Symbol	Parameter		Value	Units
V_{DS}	Drain-to-Source Voltage		120	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25°C	90	A
		T_C = 100°C	54	A
I_{DM}	Pulsed Drain Current (1)		360	A
E_{AS}	Single Pulsed Avalanche Energy (2)		225	mJ
P_D	Power Dissipation	T_C = 25°C	129	W
$R_{θJC}$	Thermal Resistance, Junction to Case		0.97	°C/W
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150	°C

Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = 250μA, V_{GS} = 0V	120	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 120V, V_{GS} = 0V	-	-	1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2.4	3	3.6	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(3)	V_{GS} = 10V, I_D = 30A	-	6.5	8.5	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 60V, f = 1MHz	-	2712	-	pF
C_{oss}	Output Capacitance		-	815	-	pF
C_{rss}	Reverse Transfer Capacitance		-	7	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V V_{DS} = 60V, I_D = 20A	-	33	-	nC
Q_{gs}	Gate Source Charge		-	7	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	8	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 60V I_D= 20A, R_{GEN} = 6Ω	-	11	-	ns
t_r	Turn-On Rise Time		-	20	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	32	-	ns
t_f	Turn-Off Fall Time		-	28	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	90	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	360	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = 30A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F = 15A, di/dt = 100A/us	-	54	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	58	-	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. E_{AS} condition: Starting T_J=25°C, V_{DD}=60V, V_G=10V, R_G=25ohm, L=0.5mH, I_{AS}=30A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Typical Performance Characteristics

Figure 1: Output Characteristics

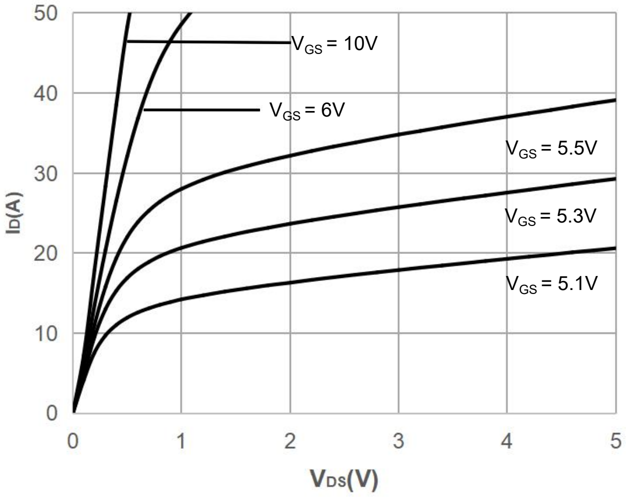


Figure 2: Typical Transfer Characteristics

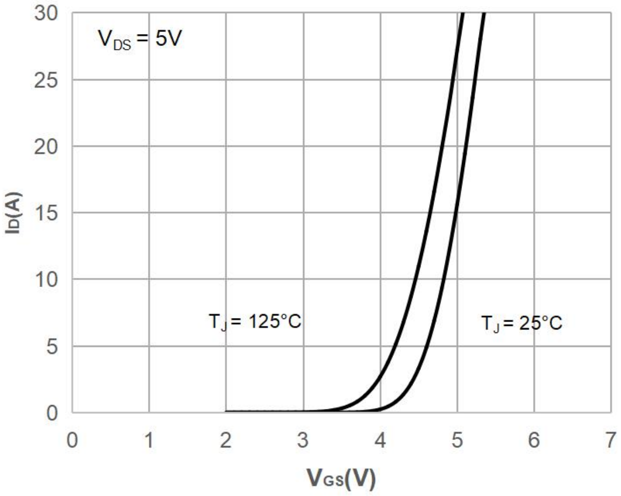


Figure 3: On-resistance vs. Drain Current

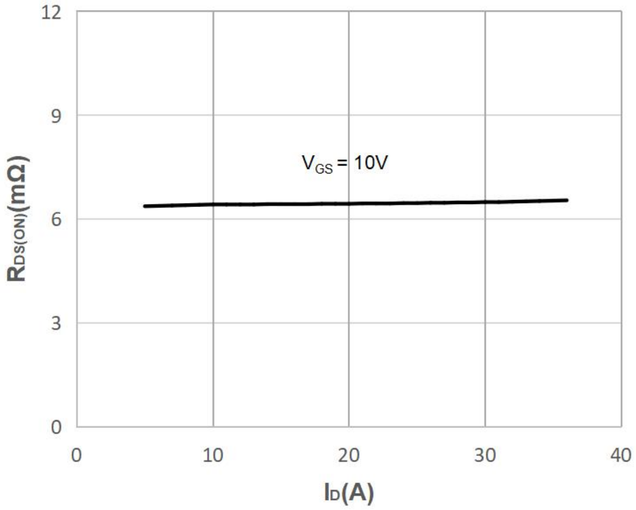


Figure 4: Body Diode Characteristics

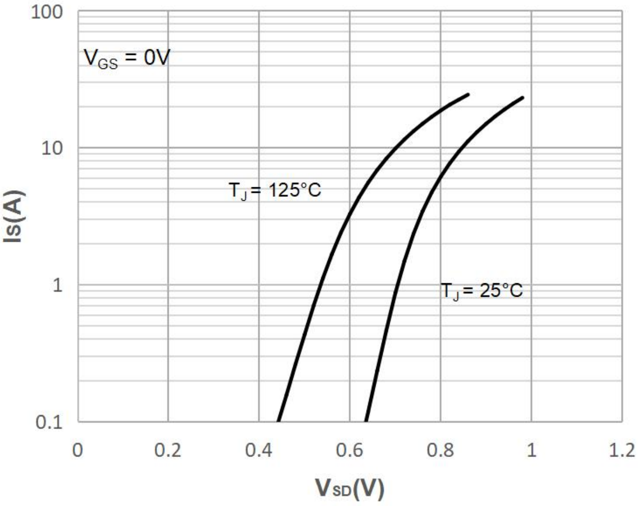


Figure 5: Gate Charge Characteristics

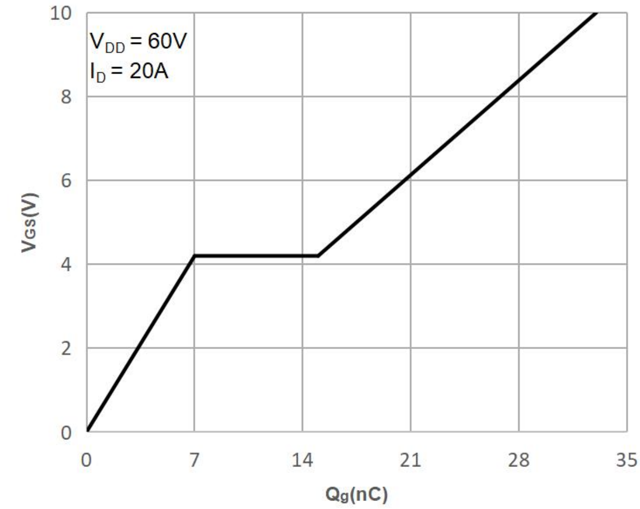
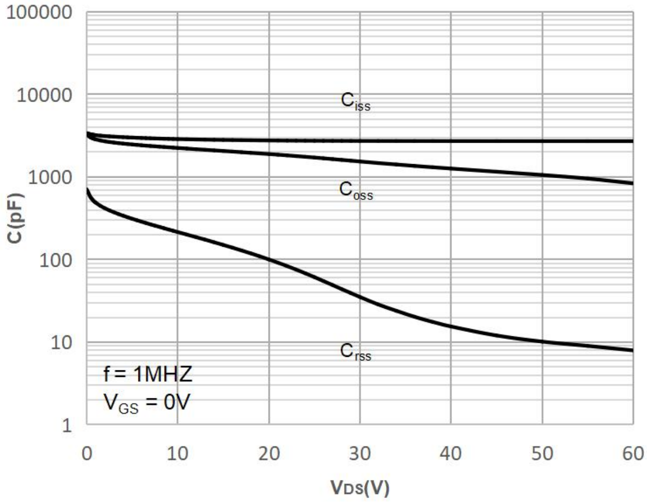


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

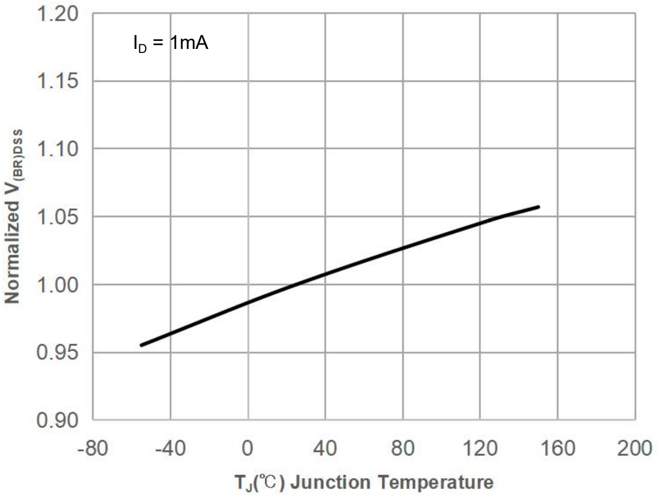


Figure 8: Normalized on Resistance vs. Junction Temperature

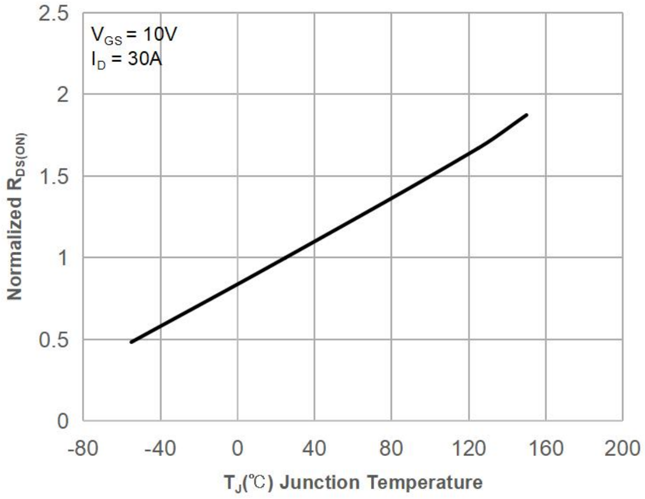


Figure 9: Maximum Safe Operating Area

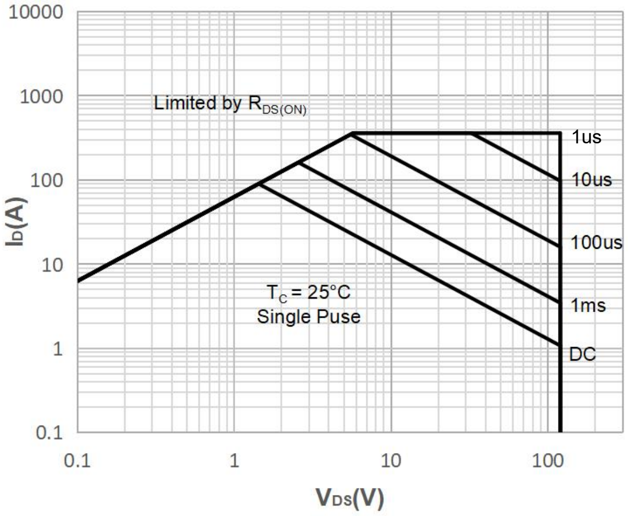


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

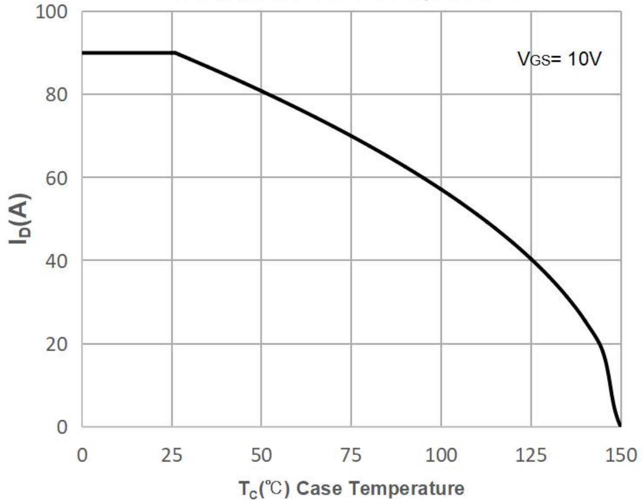


Figure 11: Normalized Maximum Transient Thermal Impedance

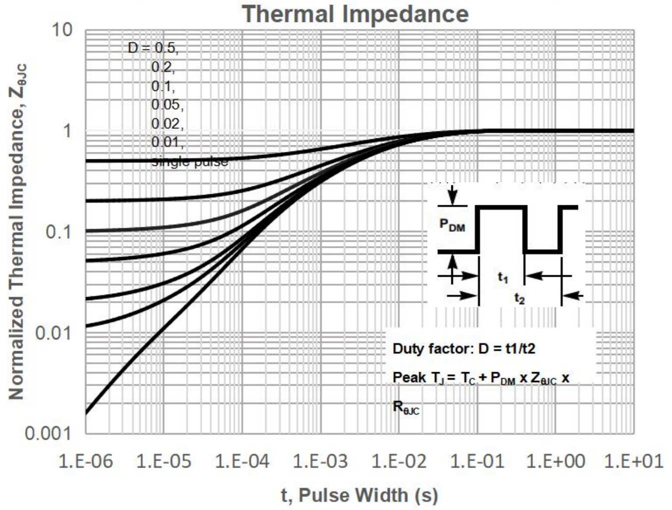
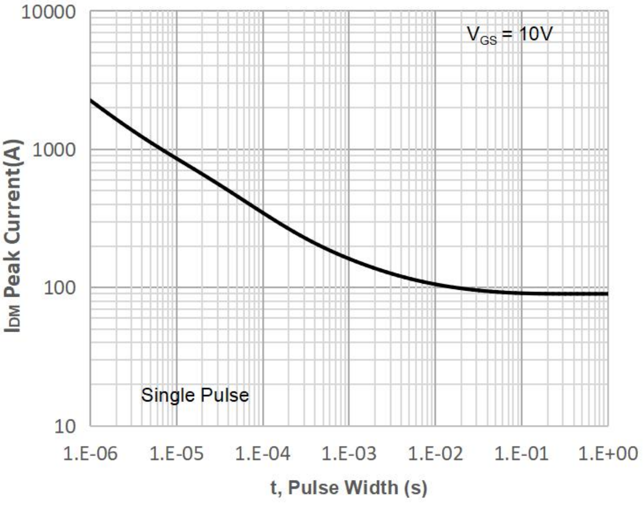


Figure 12: Peak Current Capacity



Test Circuit

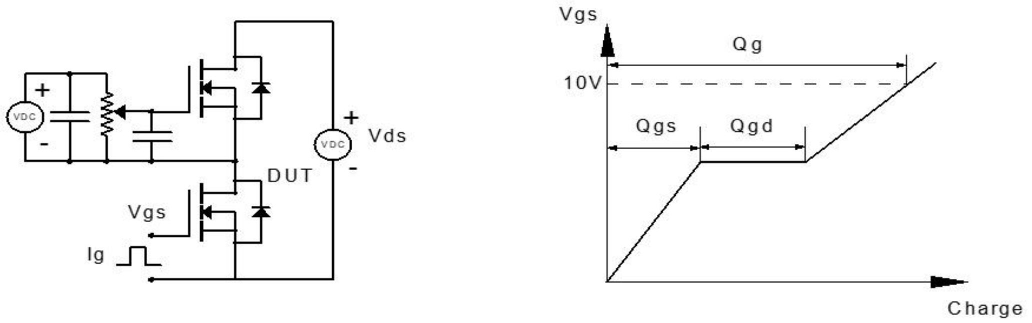


Figure 1: Gate Charge Test Circuit & Waveform

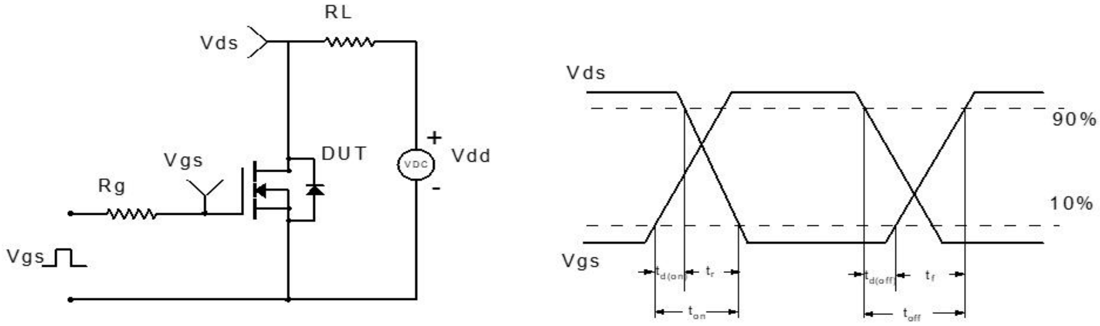


Figure 2: Resistive Switching Test Circuit & Waveform

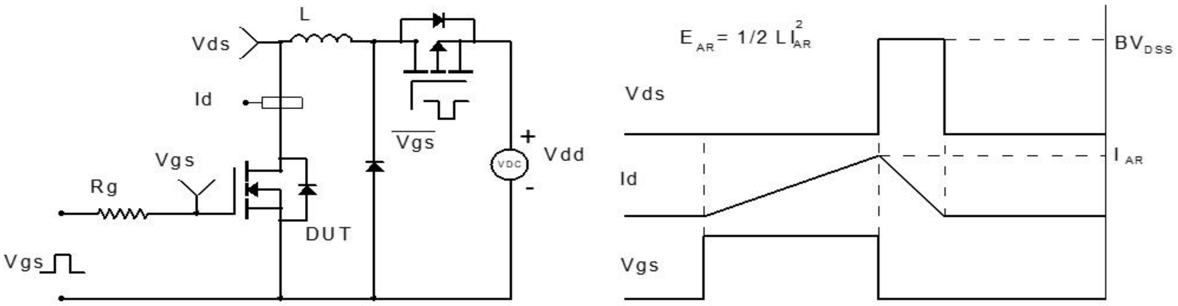


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

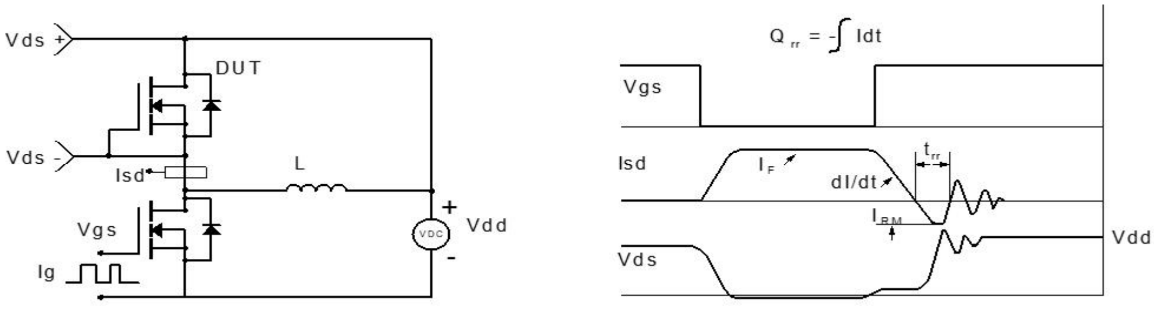
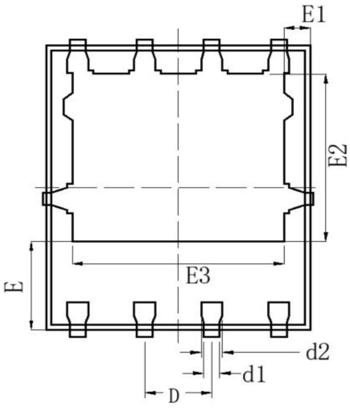
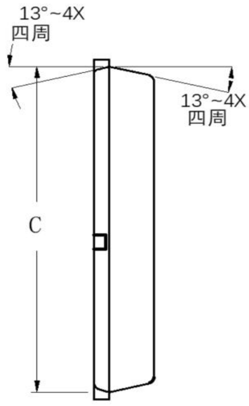
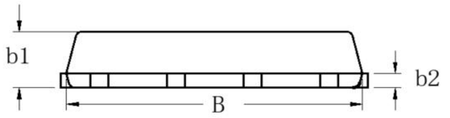


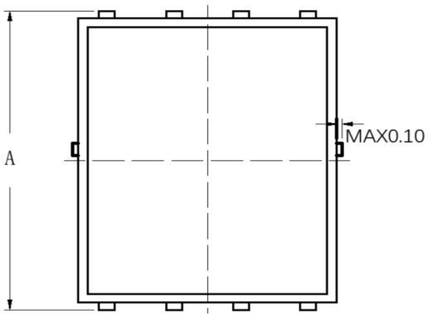
Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(PDFN5x6-8L)









COMMON DIMENSION (MM)			
PKG	PDFN 5×6-8L		
SYMBOL	MIN	TYP	MAX
A	6.000	6.100	6.200
B	4.875	4.900	4.925
b1	0.975	1.000	1.025
b2	0.246	0.254	0.262
C	5.775	5.800	5.825
D	1.245	1.270	1.295
d1	0.275	0.300	0.325
d2	0.375	0.400	0.425
E	1.725	1.775	1.825
E1	0.395	0.445	0.495
E2	3.425	3.475	3.525
E3	3.960	4.010	4.060

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Contact information

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