

Description

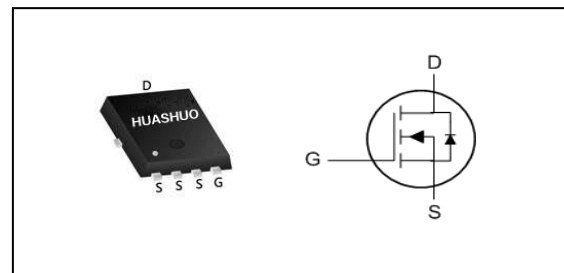
The HSBA060N10 is the high cell density trench N-ch MOSFETs, which provide excellent $R_{DS(ON)}$ and gate charge for most of the Synchronous Rectification for AC/DC Quick Charger.

- 100% EAS Guaranteed
- LOW $R_{DS(ON)}$
- Low Gate Charge
- RoHs and Halogen-Free Compliant

Product Summary

V_{DS}	100	V
$R_{DS(ON),TYP}$	4.6	$m\Omega$
I_D	86	A

PRPAK5X6 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current ^{1,6}	86	A
$I_D@T_C=70^\circ C$	Continuous Drain Current ^{1,6}	55	A
I_{DM}	Pulsed Drain Current ²	145	A
EAS	Single Pulse Avalanche Energy ³	16	mJ
I_{AS}	Avalanche Current	18	A
$P_D@T_C=25^\circ C$	Total Power Dissipation ⁴	89	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹ ($t \leq 10s$)	---	23	$^\circ C/W$
	Thermal Resistance Junction-Ambient ¹	---	50	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	1.4	$^\circ C/W$

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	100	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ₂	V _{GS} =10V, I _D =20A	---	4.6	6	mΩ
	Static Drain-Source On-Resistance ₂	V _{GS} =4.5V, I _D =20A	---	6.6	8.6	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1	2	3	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =80V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =80V, V _{GS} =0V, T _J =55°C	---	---	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =20A	---	3.1	---	S
R _g	Gate Resistance	V _{gs} =0V, V _{ds} =0V, f=1MHz	---	1.7	---	Ω
Q _g	Total Gate Charge (10V)	V _{DS} =50V, V _{GS} =10V, I _D =20A	---	60	---	nC
Q _{gs}	Gate-Source Charge		---	8	---	
Q _{gd}	Gate-Drain Charge		---	15	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =50V, V _{GS} =10V, R _G =3Ω, I _D =1A	---	11	---	ns
T _r	Rise Time		---	20	---	
T _{d(off)}	Turn-Off Delay Time		---	45	---	
T _f	Fall Time		---	23	---	
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1MHz	---	3010	---	pF
C _{oss}	Output Capacitance		---	539	---	
C _{rss}	Reverse Transfer Capacitance		---	20	---	

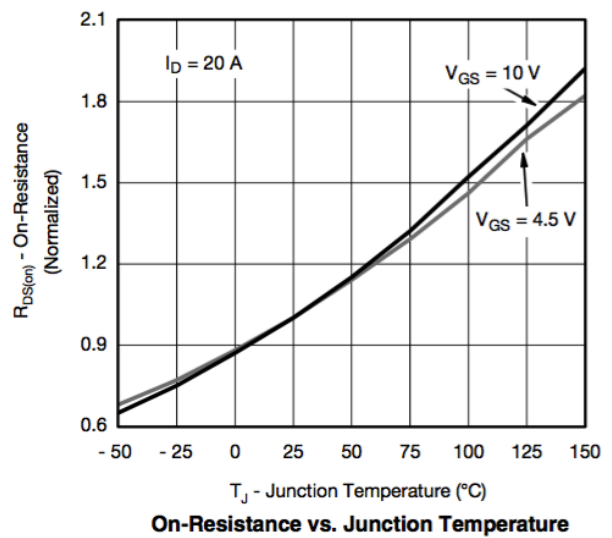
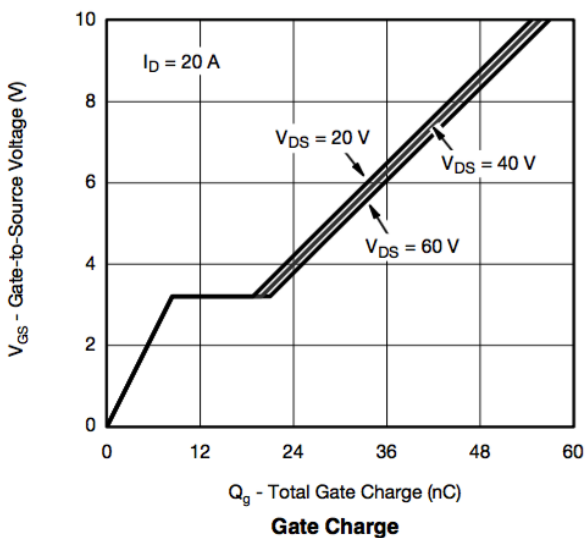
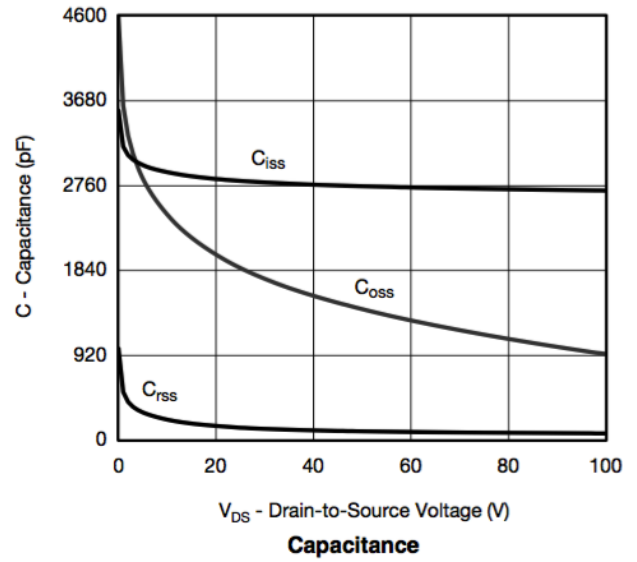
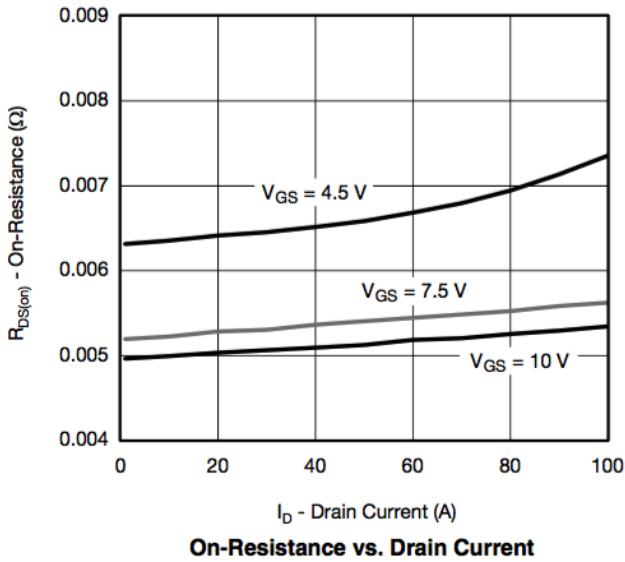
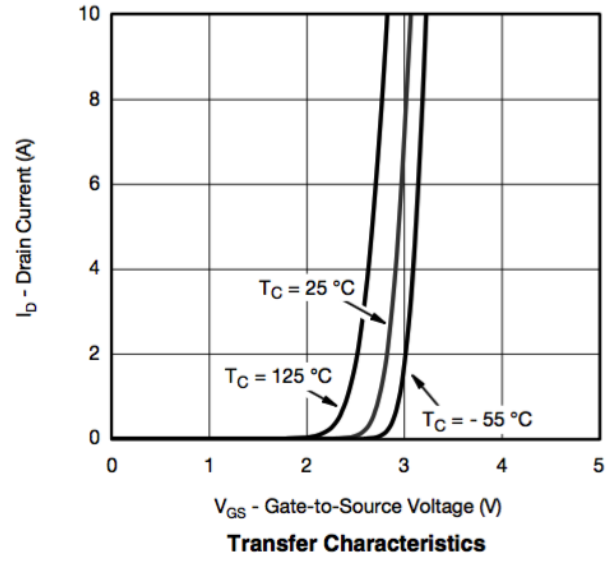
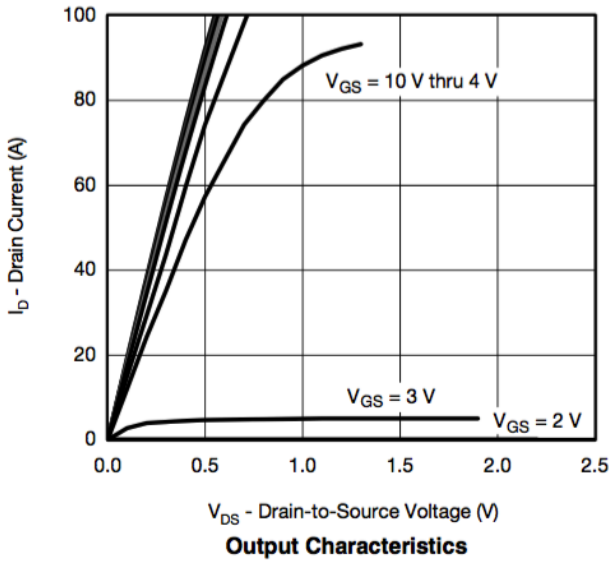
Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current _{1,5,6}	V _G =V _b =0V, Force Current	---	---	86	A
V _{SD}	Diode Forward Voltage ₂	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1.1	V
t _{rr}	Reverse Recovery Time	I _F =20A, di/dt=100A/μs,	---	55	---	nS
Q _{rr}	Reverse Recovery Charge	T _J =25°C	---	108	---	nC

Note :

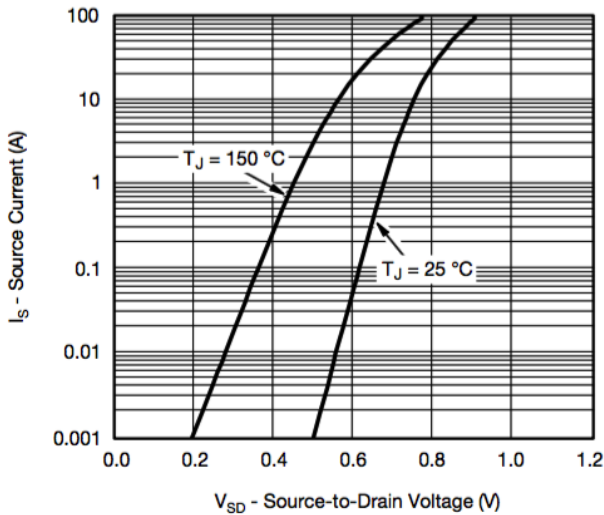
- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
- 3.The EAS data shows Max. rating. The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=18A
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.
- 6.The maximum current rating is package limited.

Typical Characteristics

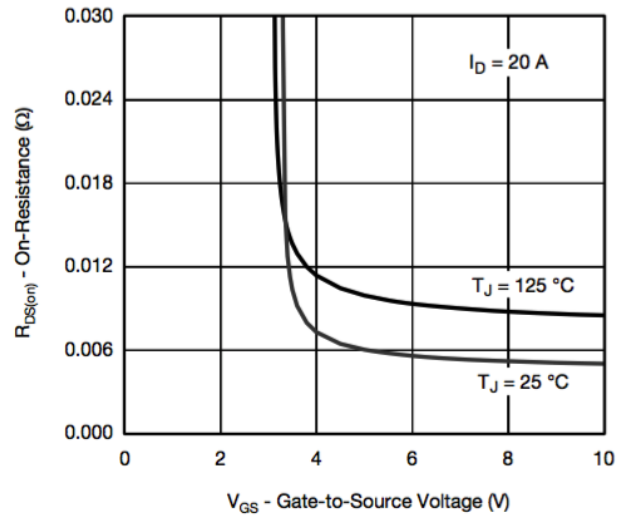




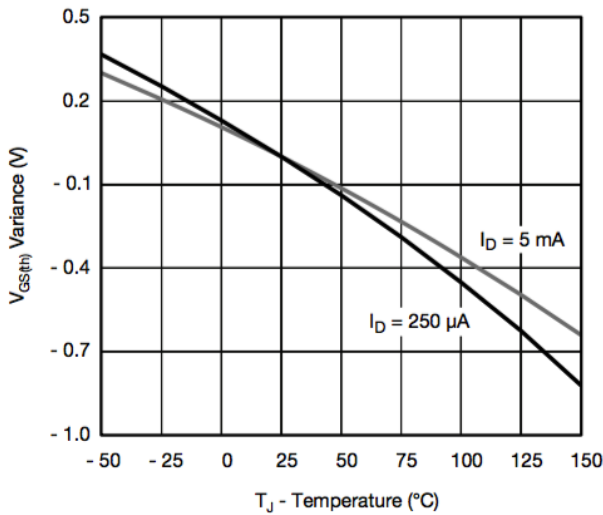
N-Ch 100V Fast Switching MOSFETs



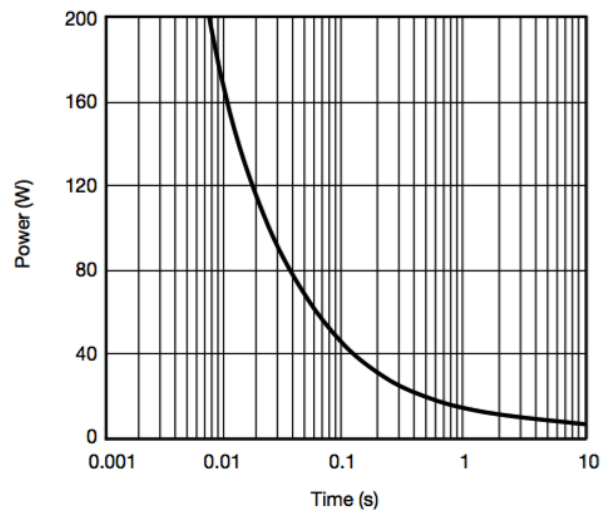
Source-Drain Diode Forward Voltage



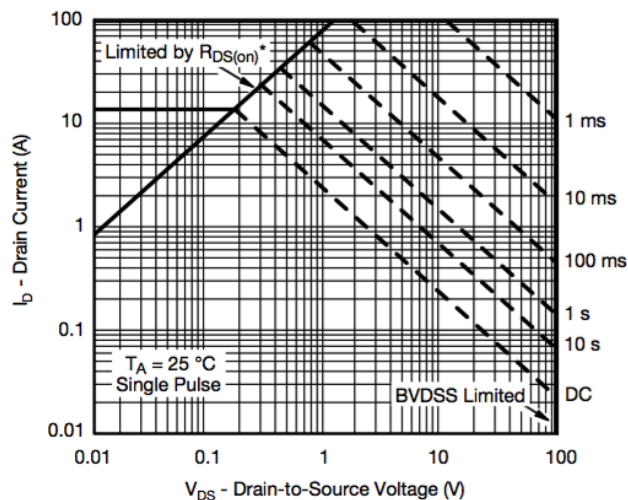
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

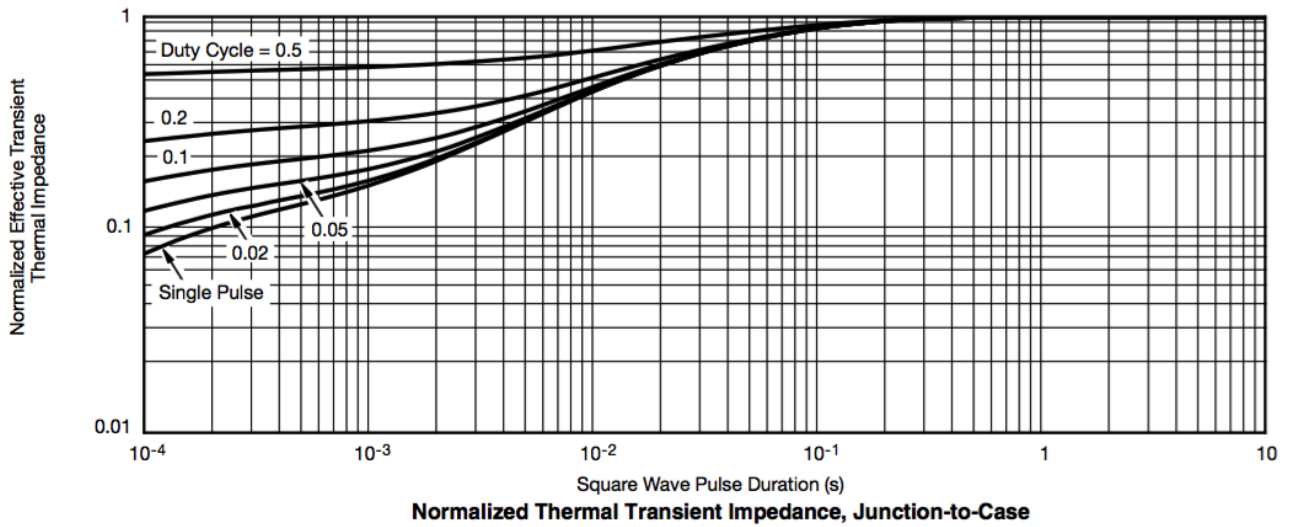
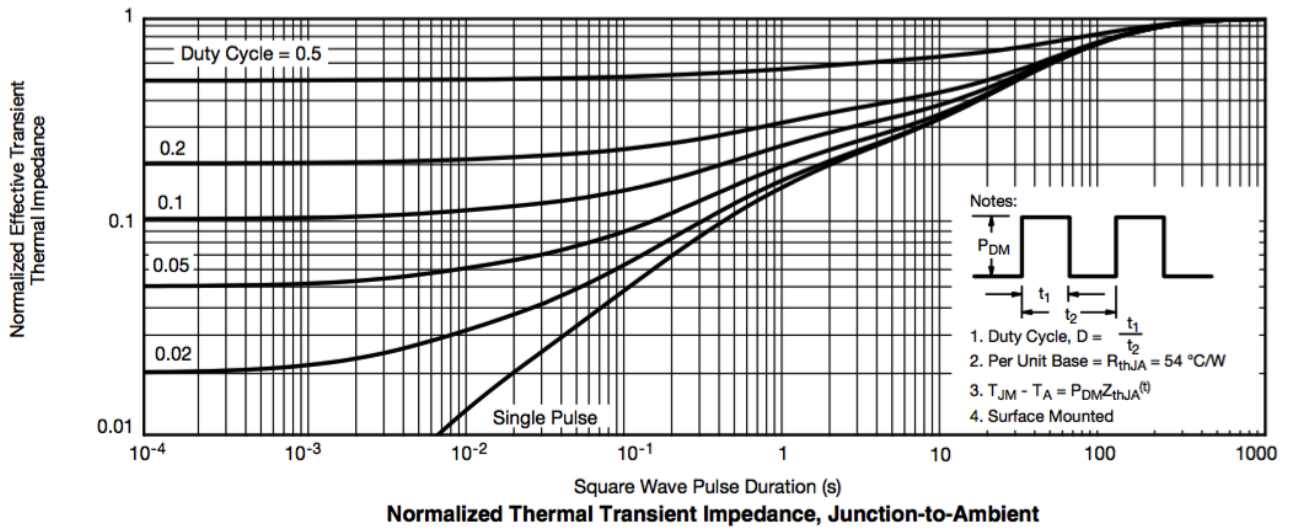


Single Pulse Power, Junction-to-Ambient

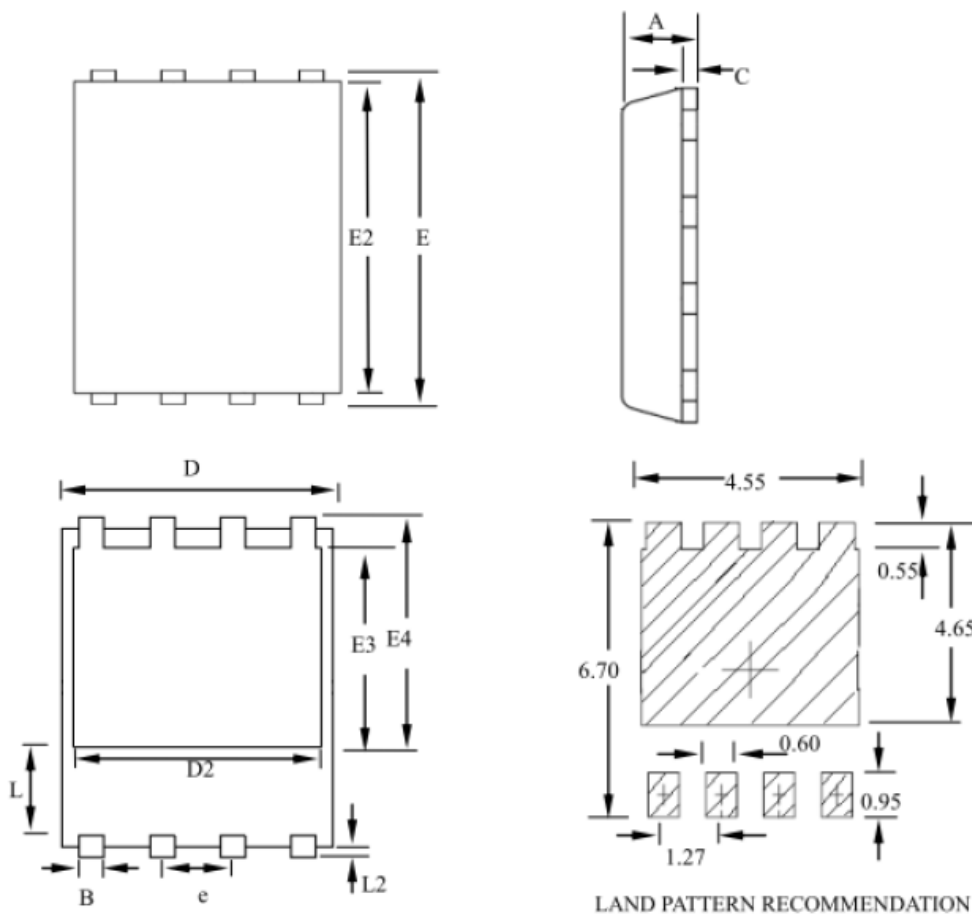


* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient



PRPAK5X6 Package Outline Dimensions



SYMBOLS	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	--	1.20	0.031	--	0.047
B	0.30	--	0.51	0.012	--	0.020
C	0.15	--	0.35	0.006	--	0.014
D	4.80	--	5.30	0.189	--	0.209
D2	3.61	--	4.35	0.142	--	0.171
E	5.90	--	6.35	0.232	--	0.250
E2	5.42	--	5.90	0.213	--	0.232
E3	3.23	--	3.90	0.127	--	0.154
E4	3.69	--	4.55	0.145	--	0.179
L	0.61	--	1.80	0.024	--	0.071
L2	0.05	--	0.36	0.002	--	0.014
e	--	1.27	--	--	0.050	--

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