

Description

Features

- Ultra-low $R_{ds(on)}$
- High speed switching
- 100% UIS Test & 100% Rg Test

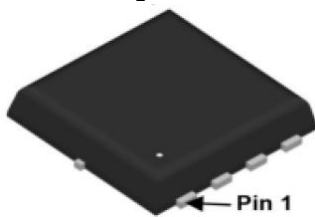
Application

- DC-DC converter
- High-frequency switching
- Motor drivers

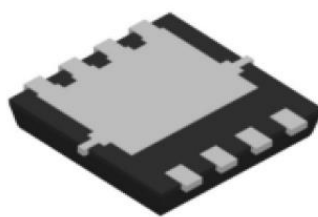
V_{DS}	40	V
$R_{ds(on),typ}@V_{gs}=10V$	2.4	m Ω
$R_{ds(on),typ}@V_{gs}=4.5V$	3.2	m Ω
I_D	150	A



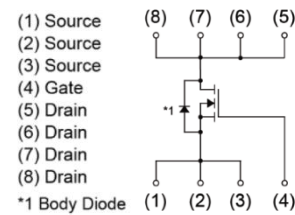
Top View



Bottom View



PDFN5*6 Pin Configuration



Package Marking and Ordering Information

Part	Marking	Package	Packing	Reel Size	Tape Width	Qty
CMS40H15M	S40H15M	PDFN5*6	Reel	NA	NA	5000pcs

Key Performance Parameters

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_c=25^\circ C$	Continuous Drain Current, $V_{GS}=10V$	150	A
$I_D@T_c=100^\circ C$	Continuous Drain Current, $V_{GS}=10V$	90	A
IDM	Pulsed Drain Current ¹	600	A
EAS	Single Pulse Avalanche Energy ⁴	170	mJ
$PD@T_c=25^\circ C$	Total Power Dissipation	83	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	Units
R _{θJA}	Thermal Resistance Junction-Ambient	52	60	°C/W
R _{θJC}	Thermal Resistance Junction-Case	1.3	1.5	°C/W

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

Symbol	Parameter	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
BVDSS	Drain-Source Breakdown Voltage	40	--	--	V	VGS=0V, ID=250uA
RDS(ON)	Static Drain-Source On-Resistance	--	2.4	3.2	mΩ	VGS=10V, ID=50A
		--	3.2	5.2		VGS=4.5V, ID=20A
VGS(th)	Gate Threshold Voltage	1	1.7	2.5	V	VGS=VDS, ID=250uA
IDSS	Drain-Source Leakage Current	--	--	1	uA	VDS=40V, VGS=0V, TJ=25°C
		--	--	10	uA	VDS=32V, VGS=0V, TJ=125°C
IGSS	Gate-Source Leakage Current	--	--	±100	nA	VGS=±20V, VDS=0V
Rg	Gate Resistance	--	2.5	--	Ω	VDS=0V, VGS=0V, f=1MHz
Qg	Total Gate Charge (10V) ^{2,3}	--	30	--	nC	VDS=20V, VGS=10V, ID=50A
Qgs	Gate-Source Charge ^{2,3}	--	6	--		
Qgd	Gate-Drain Charge ^{2,3}	--	5	--		
Td(on)	Turn-On Delay Time ^{2,3}	--	7	--	ns	VDD=20V, VGS=10V, RG=6Ω ID=50A
Tr	Rise Time ^{2,3}	--	25	--		
Td(off)	Turn-Off Delay Time ^{2,3}	--	40	--		
Tf	Fall Time ^{2,3}	--	11	--	pF	VDS=20V, VGS=0V, f=1MHz
Ciss	Input Capacitance	--	2400	--		
Coss	Output Capacitance	--	417	--		
Crss	Reverse Transfer Capacitance	--	396	--		

Diode Characteristics

Symbol	Parameter	Conditions	Typ	Max	Units
Is	Continuous Source Current	VG=VD=0V, Force Current	--	150	A
Ism	Pulsed Source Current		--	600	A
VSD	Diode Forward Voltage	VGS=0V, Is=5A, TJ=25°C	--	1.1	V

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.
4. The EAS data shows Max. rating. The test condition is VDD=20V, VGS=10V, L=0.5mH.

Typical Performance Characteristics

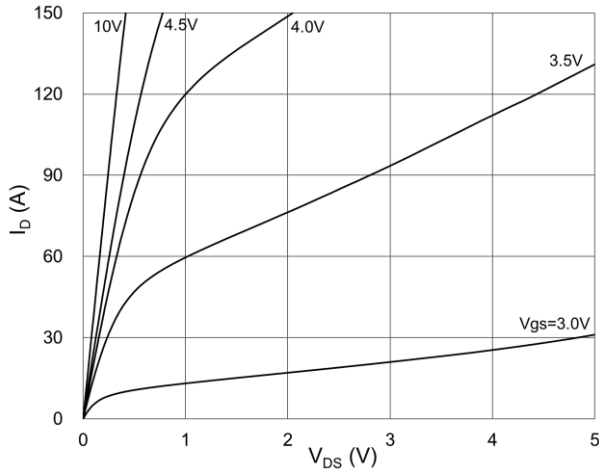
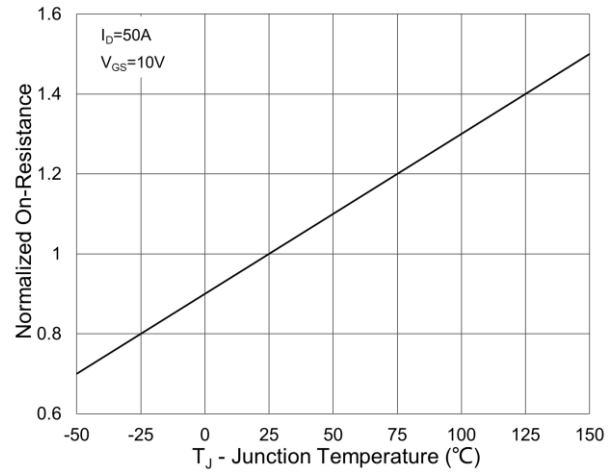
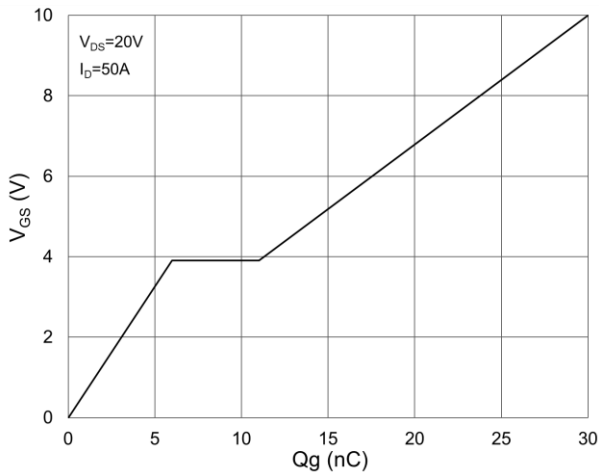
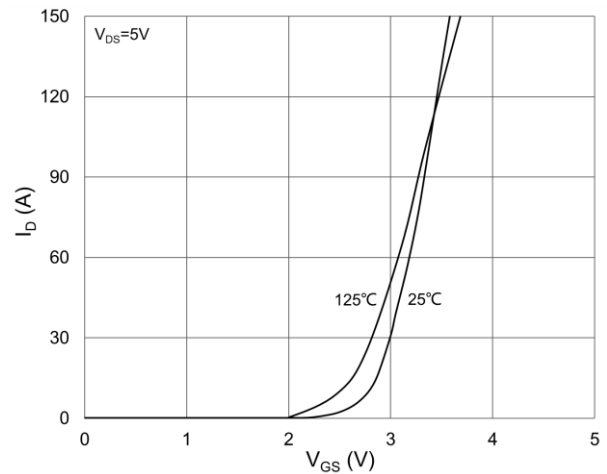
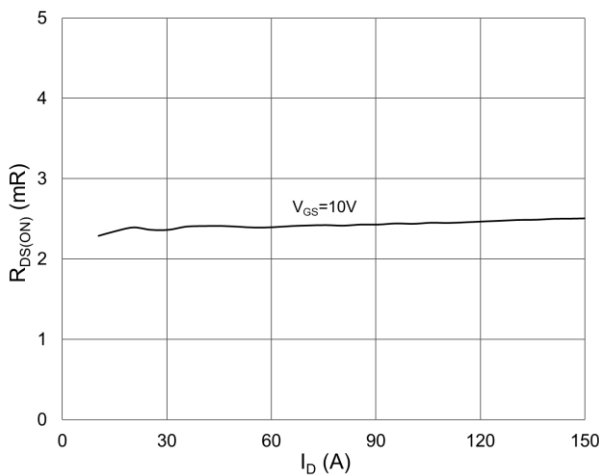
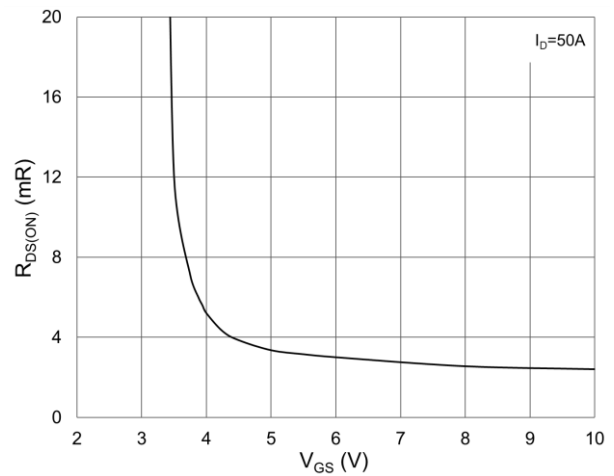
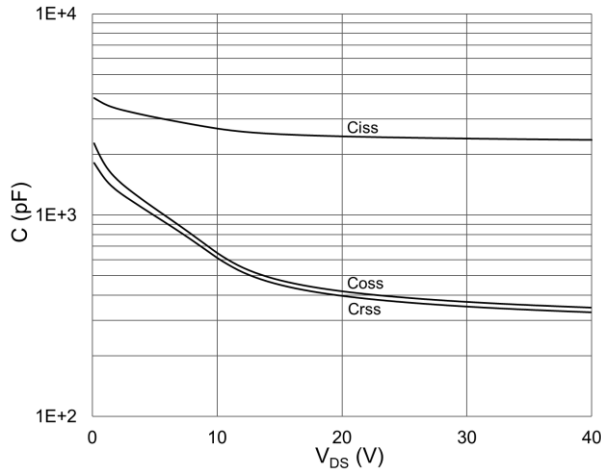
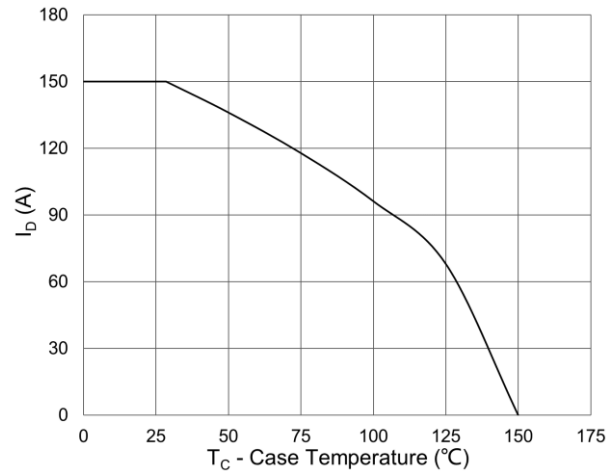
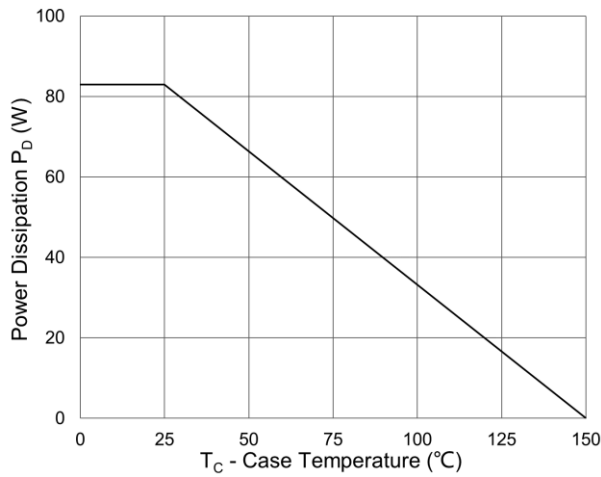
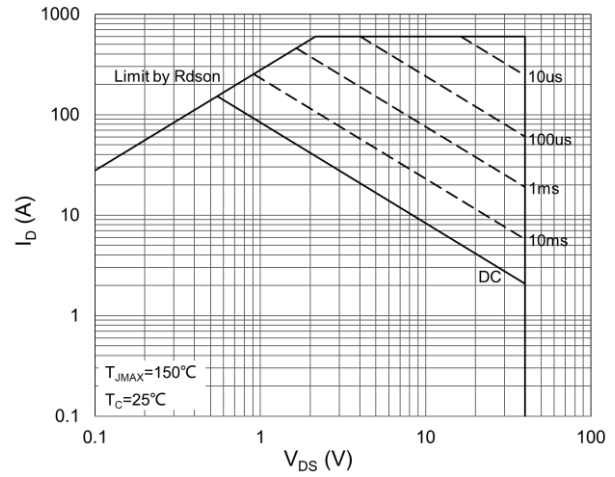
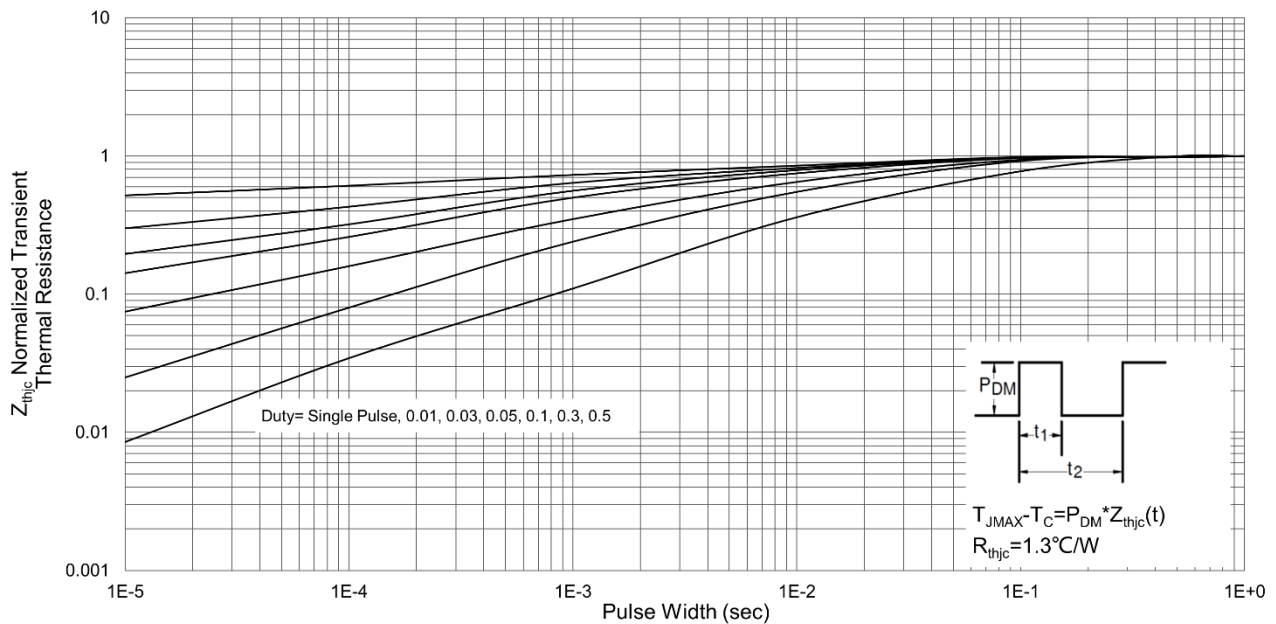
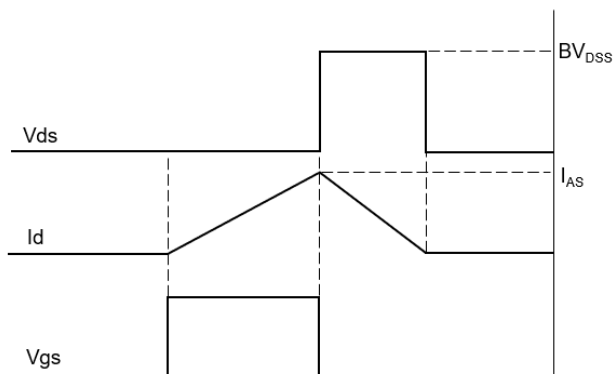
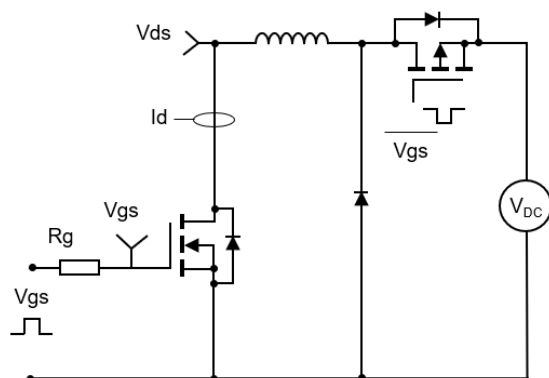
Fig1 Output Characteristics

Fig2 Normalized $R_{DS(on)}$ vs. T_J

Fig3 Gate Charge Waveform

Fig4 Transfer Characteristics

Fig5 $R_{DS(on)}$ vs. Drain Current and Gate Voltage

Fig6 $R_{DS(on)}$ vs. Gate Voltage


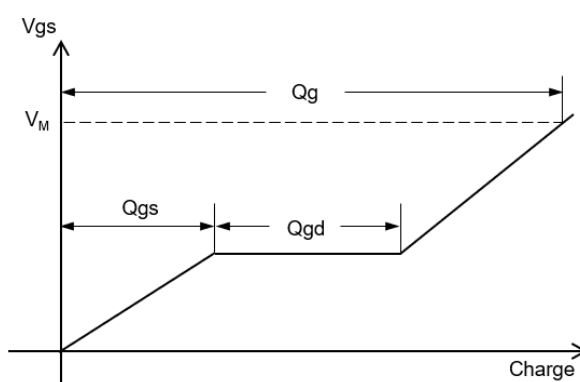
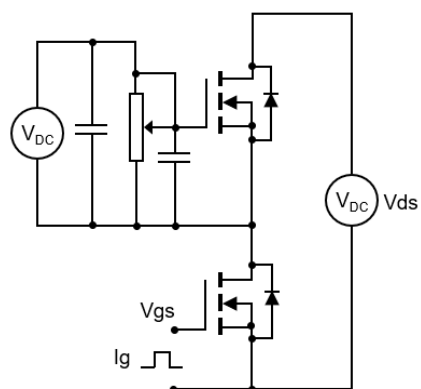
Fig7 Capacitance Characteristics

Fig8 Drain Current Derating

Fig9 Power Dissipation

Fig10 Maximum Safe Operation Area

Fig11 Normalized Transient Impedance


Test Circuit & Waveform

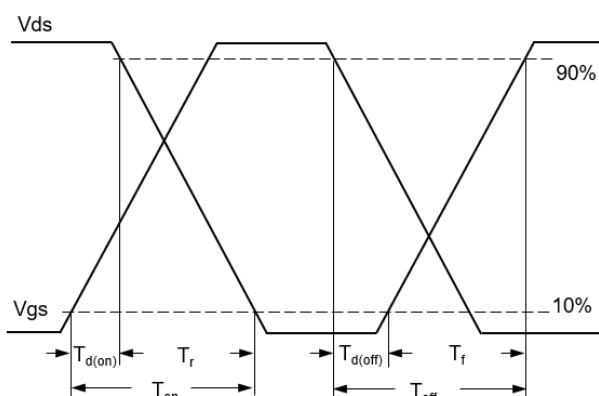
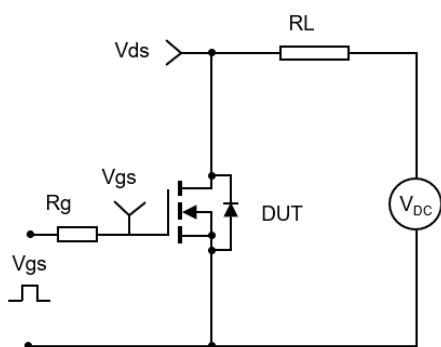
1. Unclamped Inductive Switching Test Circuit & Waveform



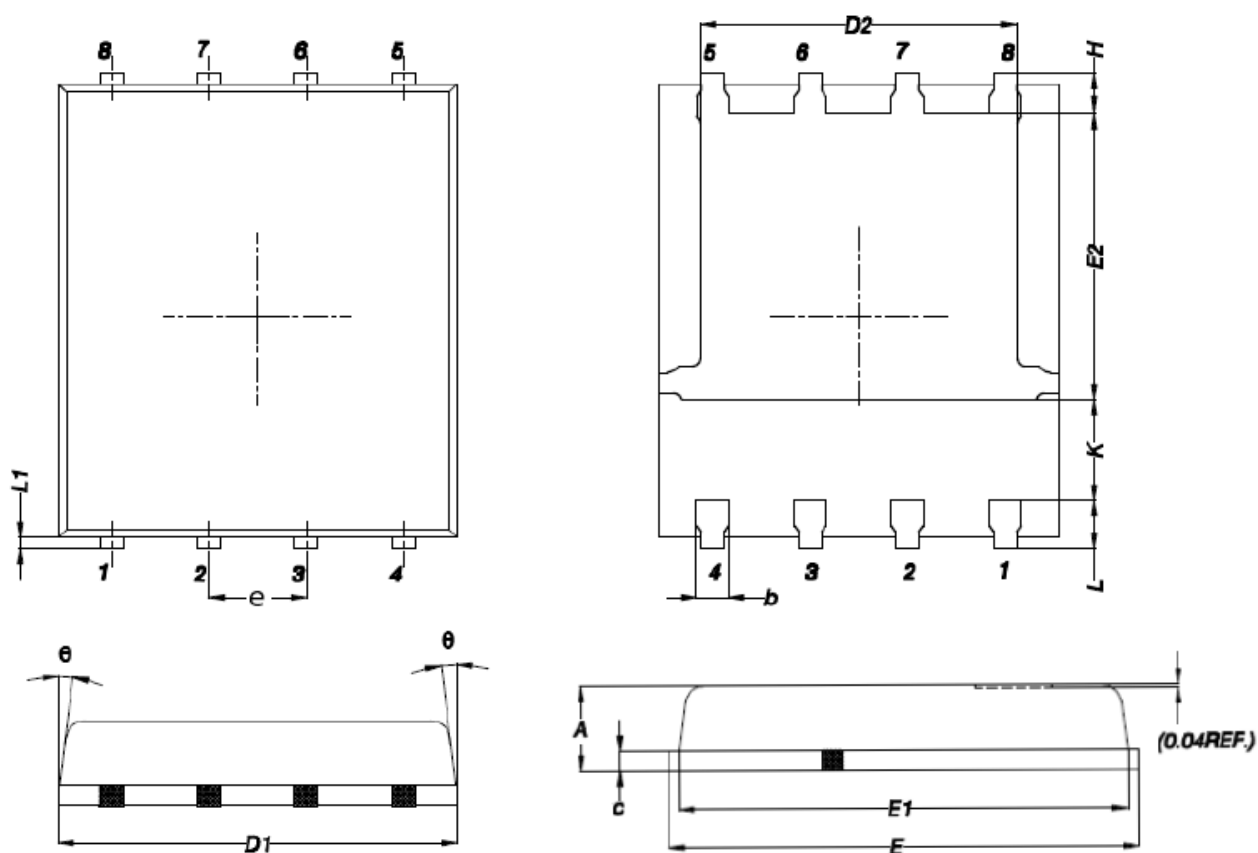
2. Gate Charge Test Circuit & Waveform



3. Resistive Switching Test Circuit & Waveform



PDFN5*6 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.200	0.850	0.047	0.031
b	0.510	0.330	0.020	0.013
C	0.300	0.200	0.012	0.008
D1	5.400	4.800	0.212	0.189
D2	4.310	3.610	0.170	0.142
E	6.300	5.850	0.248	0.230
E1	5.960	5.450	0.235	0.215
E2	3.920	3.300	0.154	0.130
e	1.27BSC		0.05BSC	
H	0.650	0.380	0.026	0.015
K	---	1.100	---	0.043
L	0.710	0.380	0.028	0.015
L1	0.250	0.050	0.009	0.002
θ	12°	0°	12°	0°