

General Description

70V, 1.5A, 100% EAS Guaranteed, Green Device Available

3URGXFWUHXUHQW(\$
JXDUDQWBWIKOOIXQFWBQUBDEDA
DSSURB

Features

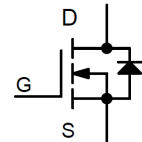
- z Advanced high cell density Trench technology
- z Super Low Gate Charge
- z Excellent CdV/dt effect decline
- z 100% EAS Guaranteed
- z Green Device Available

Product Summary

BVDSS	RDSON	ID
30V	m	A

Applications

- z High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- z Networking DC-DC Power System
- z Load Switch

SOP8 Pin Configuration

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	10 ^a	A
$I_D@T_C=70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	9.5	A
I_{DM}	Pulsed Drain Current ²	40	A
EAS	Single Pulse Avalanche Energy ³	5.0	mJ
I_{AS}	Avalanche Current	10	A
$P_D@T_A=25^\circ C$	Total Power Dissipation ⁴	1.5	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	---	53	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	25	$^\circ C/W$

Notes:

- a. Package Limited.
- b. Surface Mounted on 1" x 1" FR4 board.
- c. t = 10 s.
- d. Maximum under Steady State conditions is 85 $^\circ C/W$.

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	30	---	---	V
ΔBV _{DSS} /ΔT _J	BVDSS Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.023	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =8.4A	---	17	21	mΩ
		V _{GS} =4.5V, I _D =2A	---	27	33	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.4	1.9	2.8	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-5.08	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =24V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =24V, 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 =8.4A	---	22	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	2.6	5.2	Ω
Q _g	Total Gate Charge (4.5V)	V _{DS} =15V, V _{GS} =4.5V, I _D =8.4A	---	3.7	---	nC
Q _{gs}	Gate-Source Charge		---	1.6	---	
Q _{gd}	Gate-Drain Charge		---	1.3	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =15V, V _{GS} =10V, R _G =1Ω, I _D =6.7A, R _L =2.2Ω.	---	20	30	ns
T _r	Rise Time		---	15	25	
T _{d(off)}	Turn-Off Delay Time		---	11	20	
T _f	Fall Time		---	10	15	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	405	---	pF
C _{oss}	Output Capacitance		---	110	---	
C _{riss}	Reverse Transfer Capacitance		---	56	---	

Guaranteed Avalanche Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
EAS	Single Pulse Avalanche Energy ⁵	V _{DD} =25V, L=0.1mH, I _{AS} =10A	5.0	---	---	mJ

Diode Characteristics

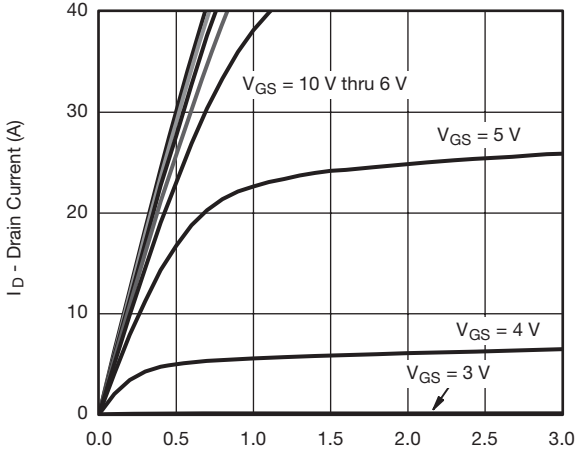
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,6}	V _G =V _D =0V, Force Current	---	---	4.2	A
I _{SM}	Pulsed Source Current ^{2,6}		---	---	40	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =6.7A, T _J =25°C	---	---	1.2	V
t _{rr}	Reverse Recovery Time	I _F =6.7A, dI/dt=100A/μs, T _J =25°C	---	15	---	nS
Q _{rr}	Reverse Recovery Charge		---	8	---	nC

Notes:

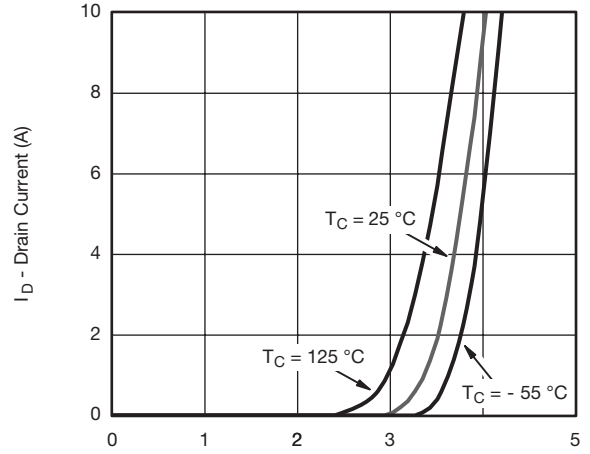
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %
- Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

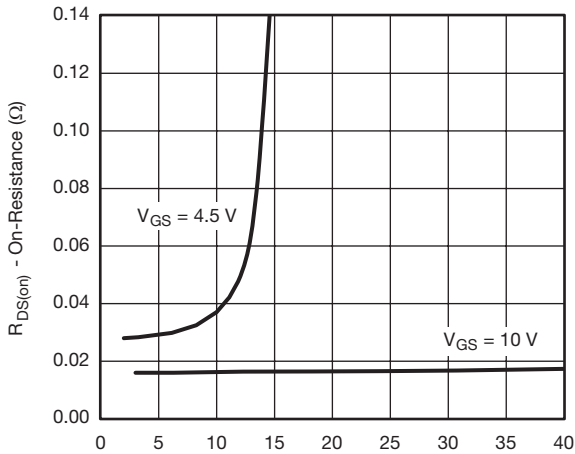
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



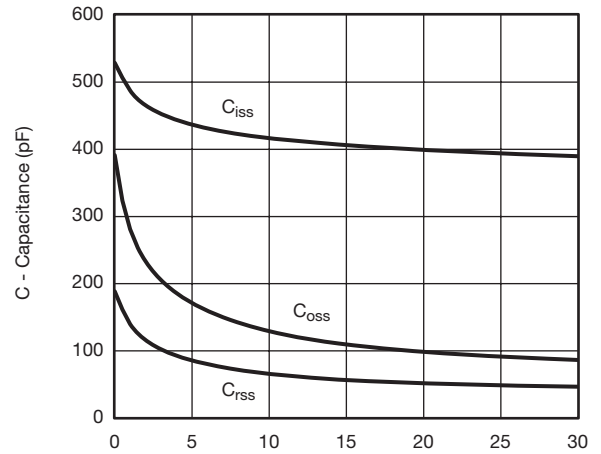
Output Characteristics



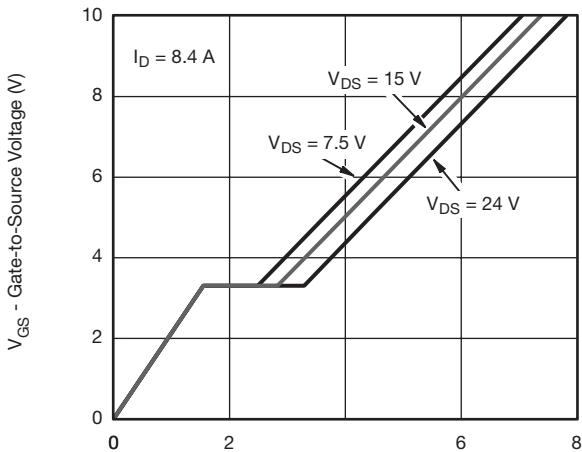
Transfer Characteristics



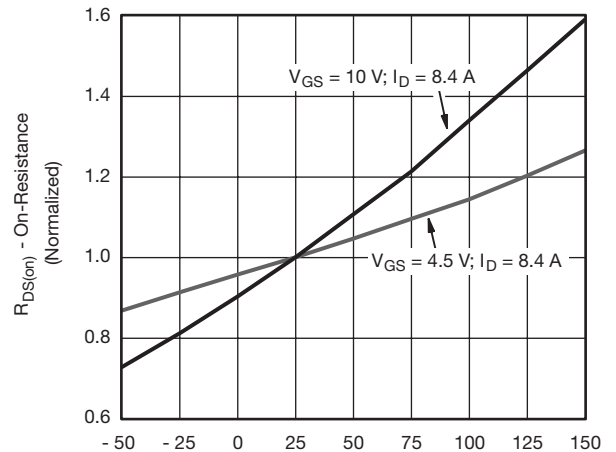
On-Resistance vs. Drain Current



Capacitance

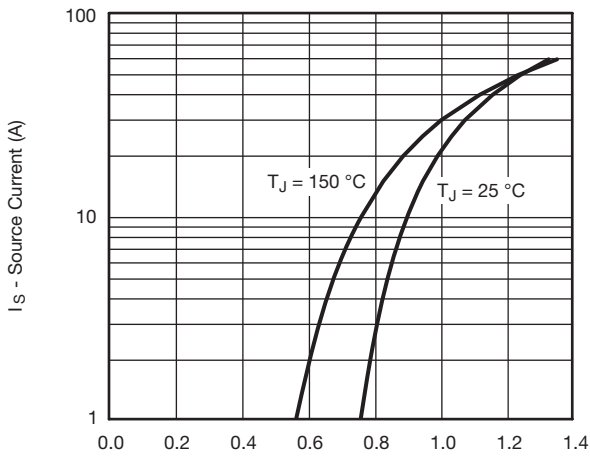


Gate Charge

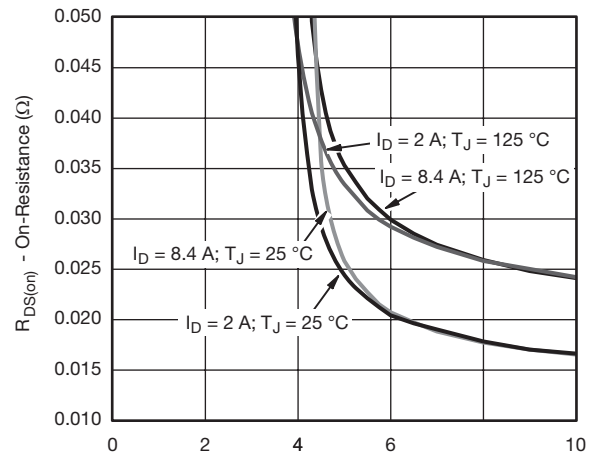


On-Resistance vs. Junction Temperature

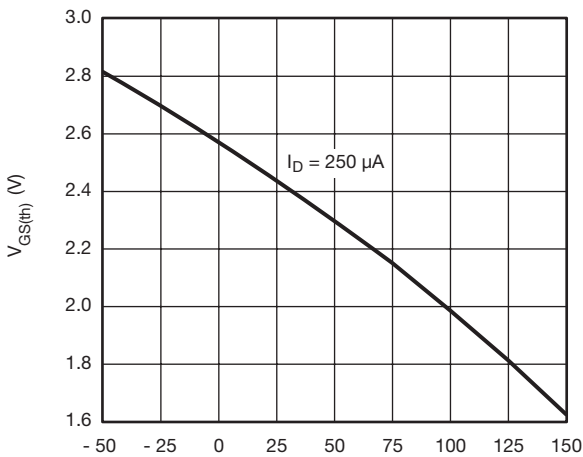
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



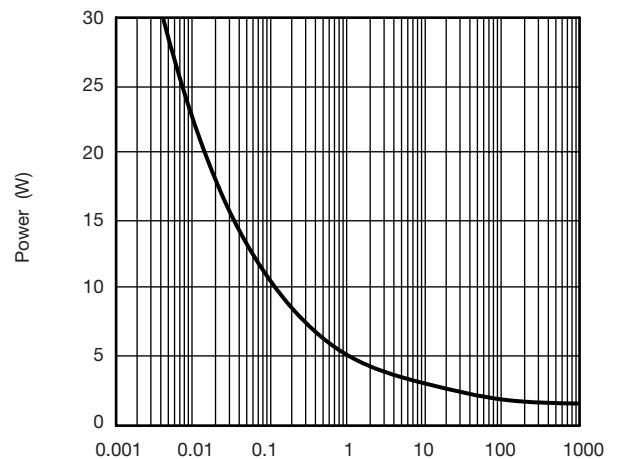
Source-Drain Diode Forward Voltage



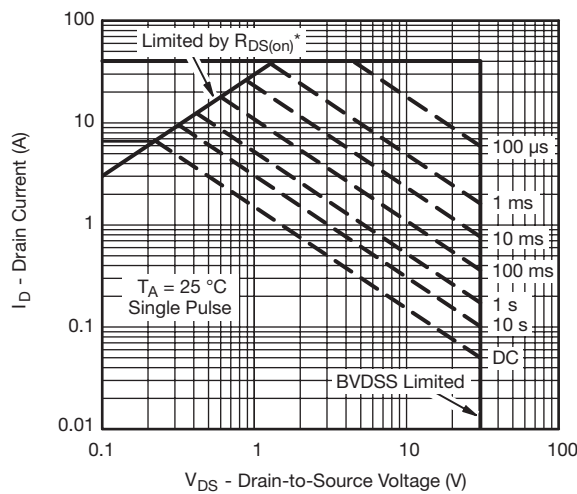
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



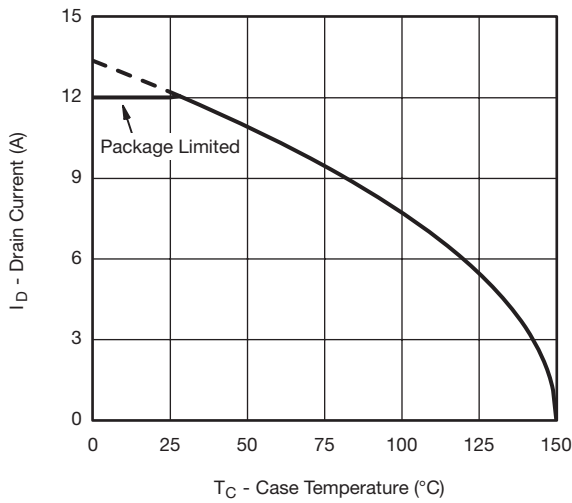
Single Pulse Power



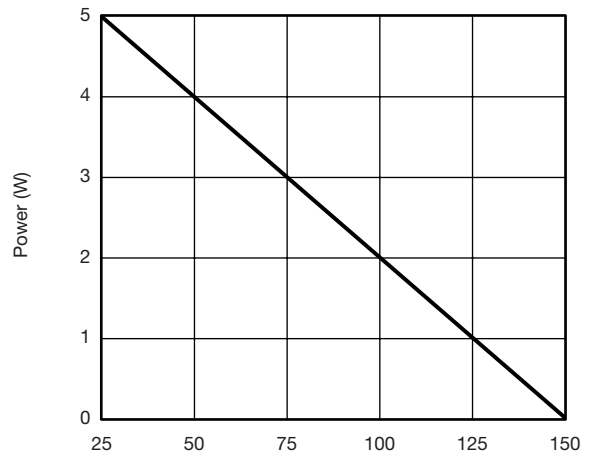
* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

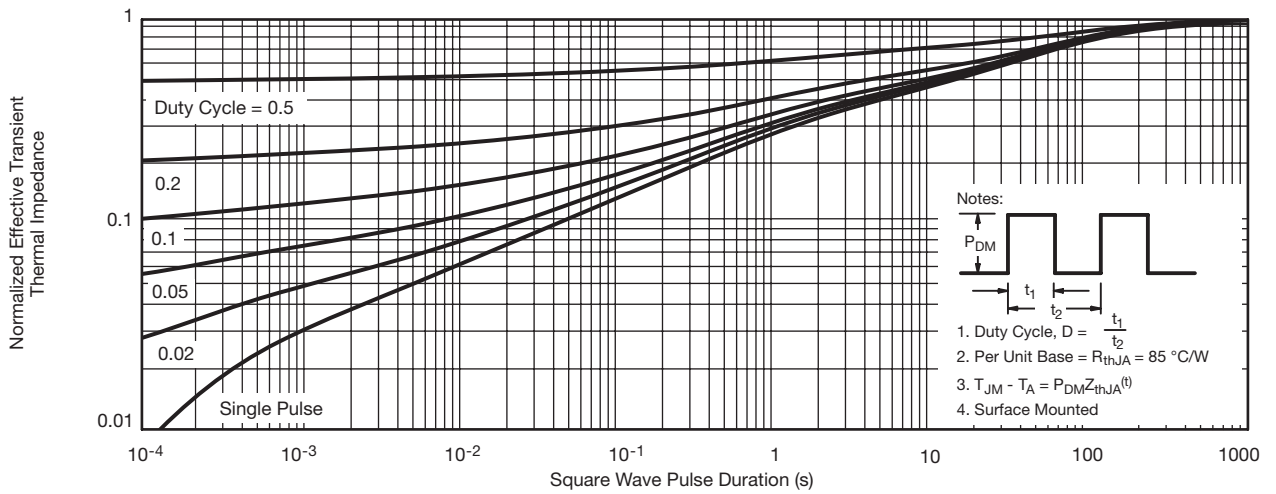


T_C - Case Temperature (°C)
Current Derating*

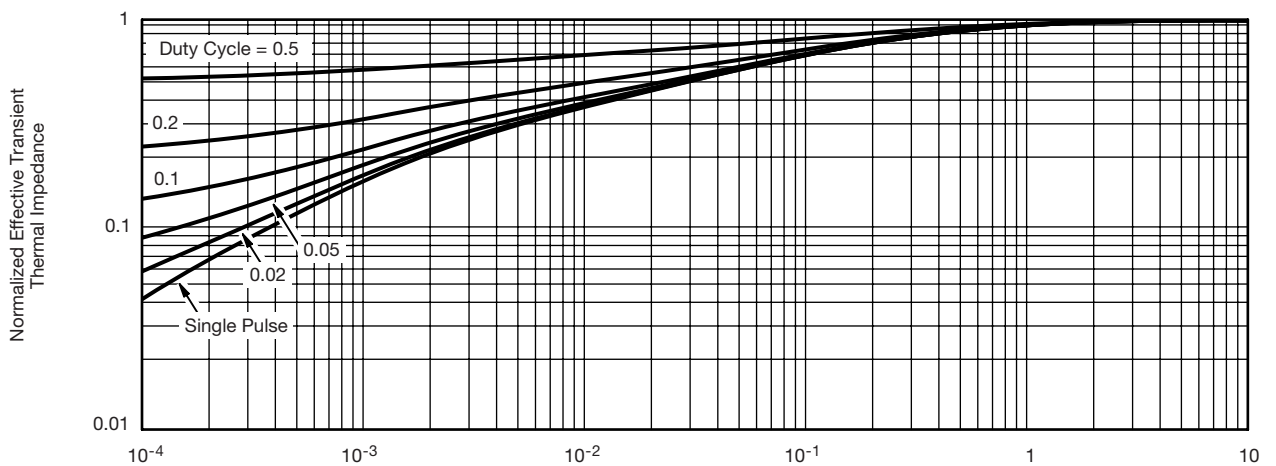


Power Derating

* The power dissipation P_D is based on $T_{J(max)} = 150\text{ }^\circ\text{C}$, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

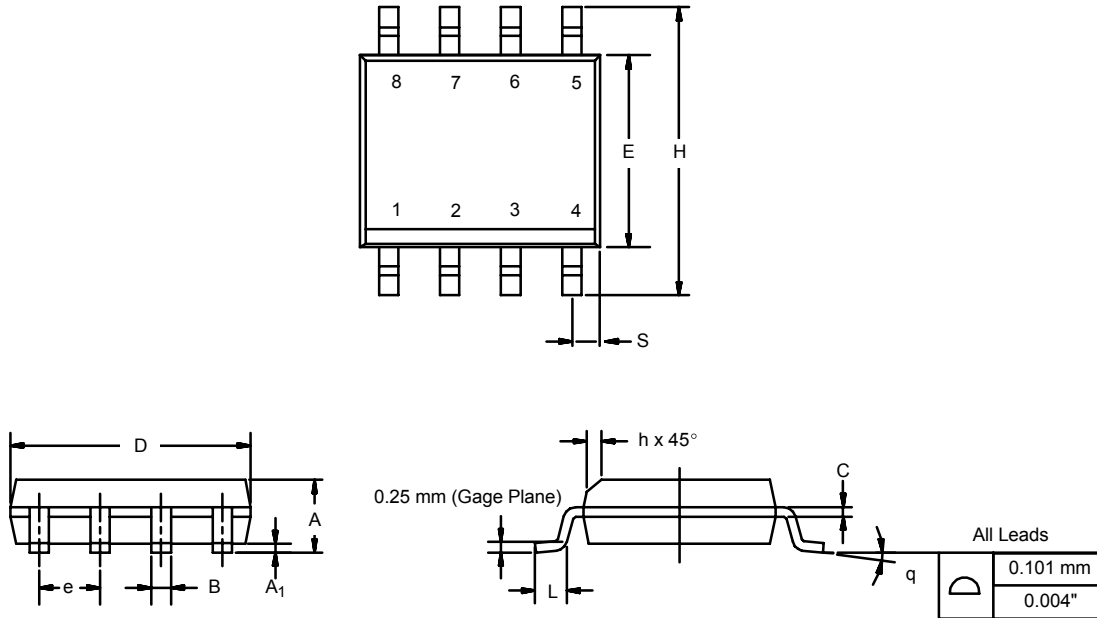


Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

SOP-8



DIM	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A ₁	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.0075	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°
S	0.44	0.64	0.018	0.026
ECN: C-06527-Rev. I, 11-Sep-06				
DWG: 5498				



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