

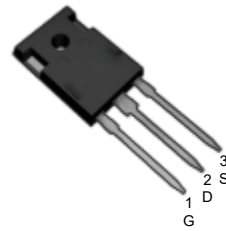
Features

- 650V/24A
 $R_{DS(ON)}=0.121\Omega(\text{typ})@V_{GS}=10V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

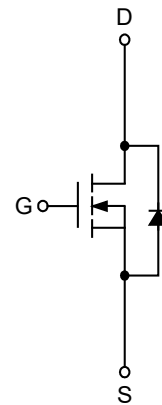
Applications

- AC/DC Power Conversion in Switched Mode Power Supplies (SMPS).
- Uninterruptible Power Supply (UPS).
- Adapter.

Pin Description



TO-247



N-Channel MOSFET

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
Common Ratings				
V _{DSS}	Drain-Source Voltage		650	V
V _{GSS}	Gate-Source Voltage		±30	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	
I _S	Diode Continuous Forward Current	T _C =25°C	24	A
I _D	Continuous Drain Current	T _C =25°C	24	
	Continuous Drain Current	T _C =100°C	18	
I _{DM} ^a	Pulsed Drain Current	T _C =25°C	72	
P _D	Maximum Power Dissipation	T _C =25°C	208	W
		T _C =100°C	83	
R _{θJC}	Thermal Resistance-Junction to Case		0.6	°C/W
R _{θJA}	Thermal Resistance-Junction to Ambient		40	°C/W
I _{AS} ^b	Avalanche Current, Single pulse	L=10mH	6.9	A
E _{AS} ^b	Avalanche Energy, Single pulse	L=10mH	239	mJ

Note a : Pulse width limited by maximum junction temperature.

Note b : UIS tested and pulse width limited by maximum junction temperature (initial temperature $T_J=25^{\circ}\text{C}$).

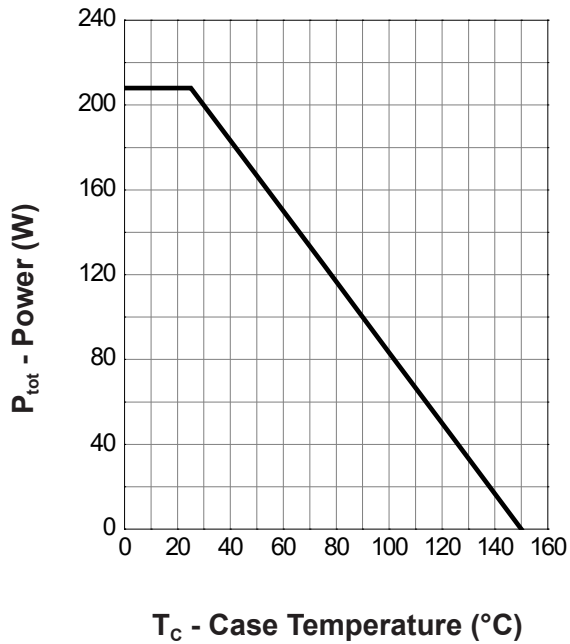
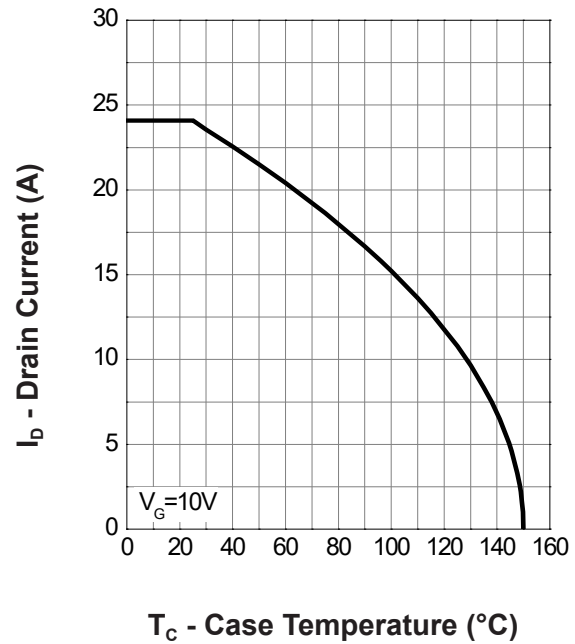
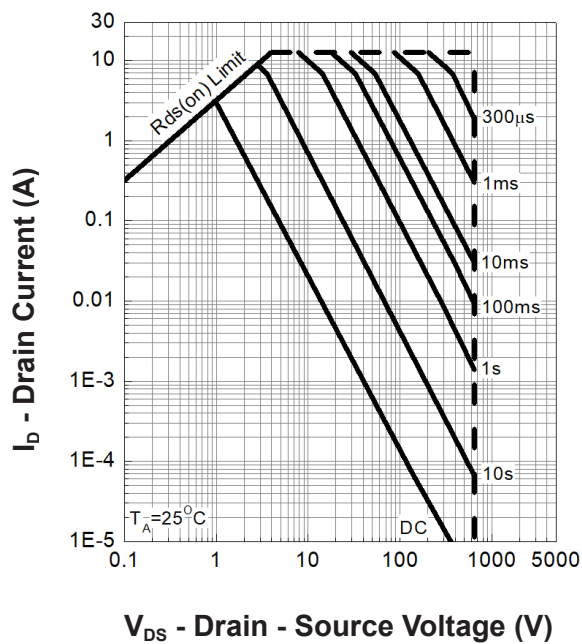
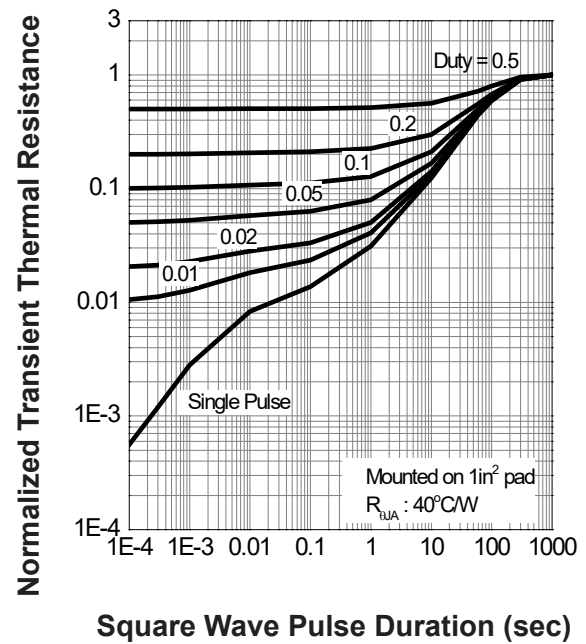
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	650	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =520V, V _{GS} =0V T _J =85°C	-	-	1 30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	2.5	3.5	4.5	V
I _{GSS}	Gate Leakage Current	V _{GS} =±30V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^c	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =12A	-	0.121	0.13	Ω
Diode Characteristics						
V _{SD} ^c	Diode Forward Voltage	I _{SD} =25A, V _{GS} =0V	-	0.9	1.3	V
t _{rr} ^d	Reverse Recovery Time	I _{SD} =12A, dI _{SD} /dt=100A/μs	-	305	-	ns
Q _{rr} ^d	Reverse Recovery Charge		-	4.7	-	μC
Dynamic Characteristics ^d						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz	-	3	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =325V, Frequency=1.0MHz	-	2208	2870	pF
C _{oss}	Output Capacitance		-	55	-	
C _{rss}	Reverse Transfer Capacitance		-	5	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =30V, R _L =30Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	23	42	ns
t _r	Turn-on Rise Time		-	20	36	
t _{d(OFF)}	Turn-off Delay Time		-	59	106	
t _f	Turn-off Fall Time		-	207	372	
Gate Charge Characteristics ^d						
Q _g	Total Gate Charge	V _{DS} =325V, V _{GS} =10V, I _{DS} =12A	-	50	71	nC
Q _{gs}	Gate-Source Charge		-	11	-	
Q _{gd}	Gate-Drain Charge		-	19	-	

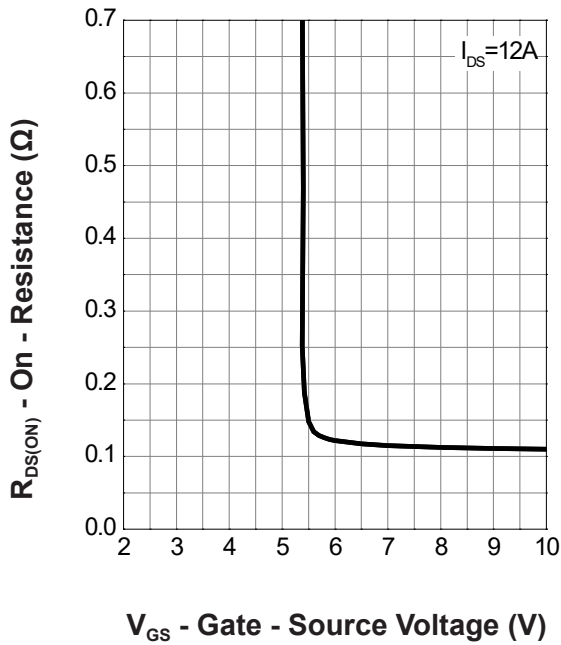
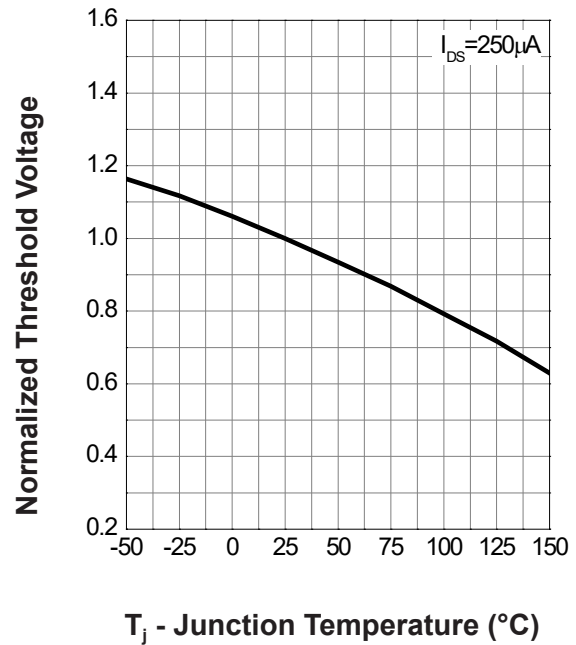
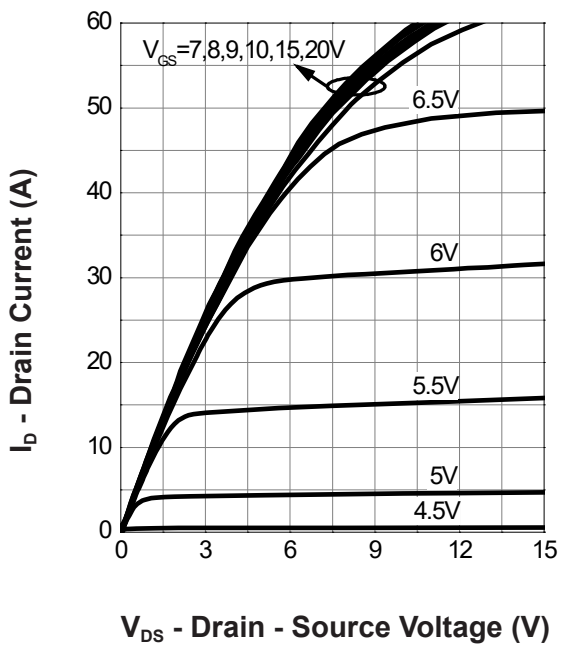
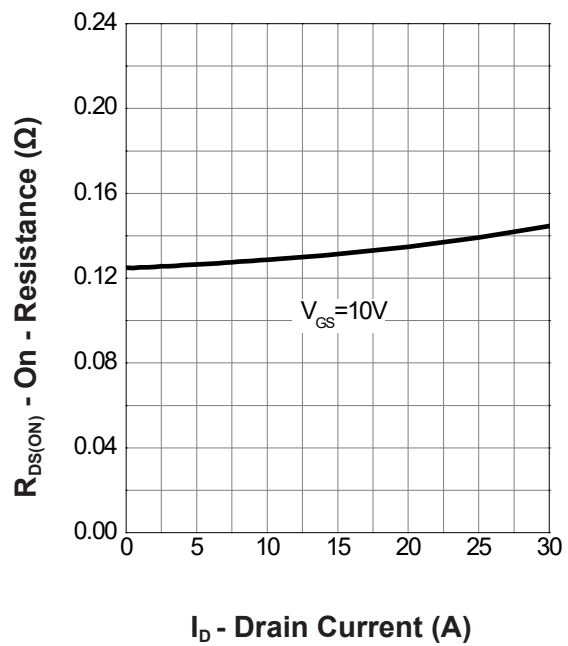
Note c : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Note d : Guaranteed by design, not subject to production testing.

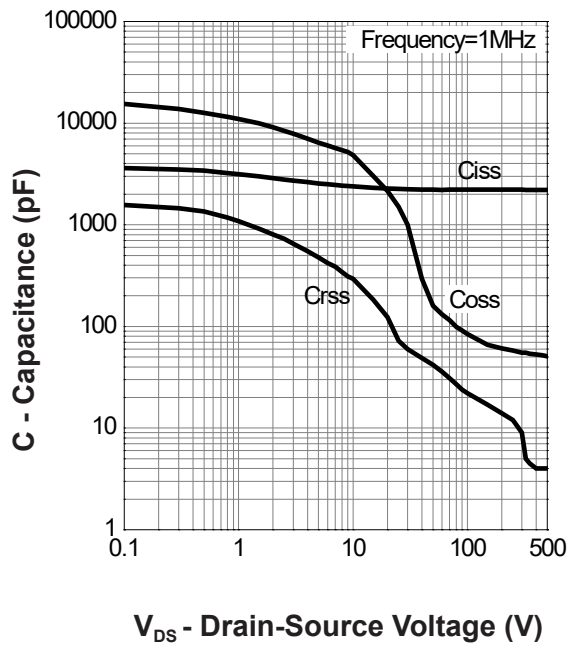
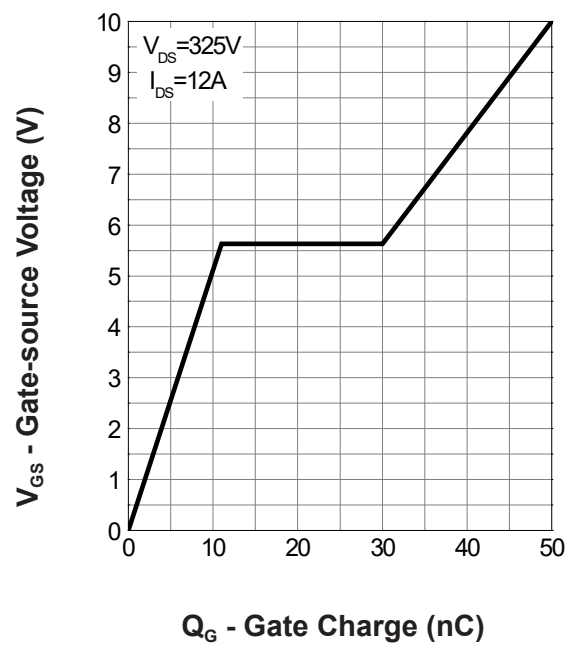
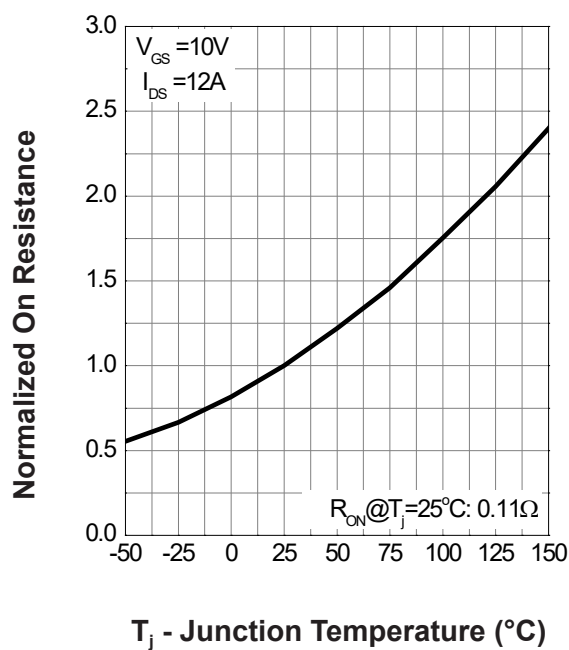
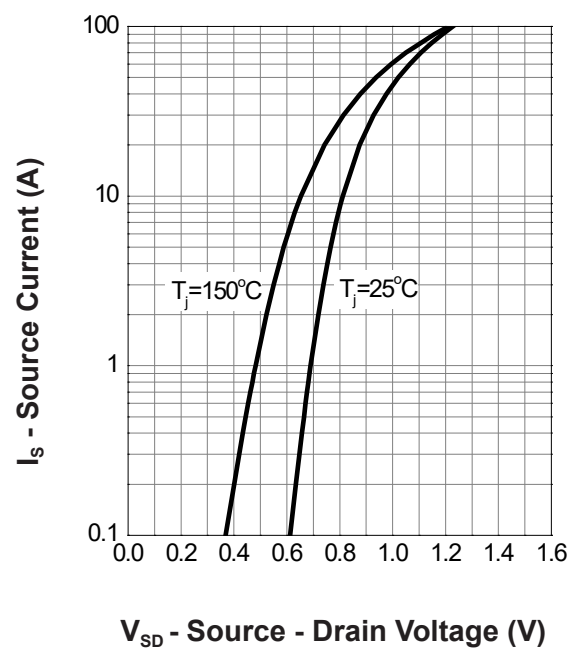
Typical Operating Characteristics

Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance


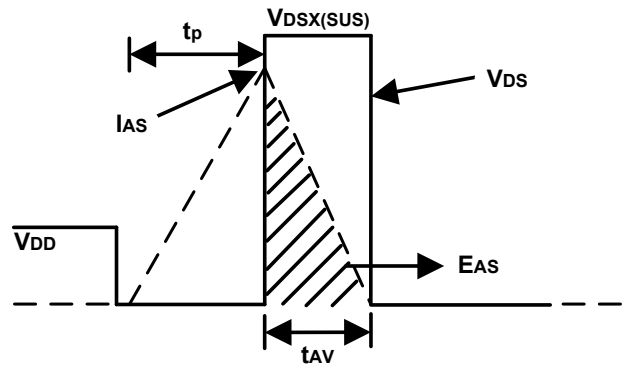
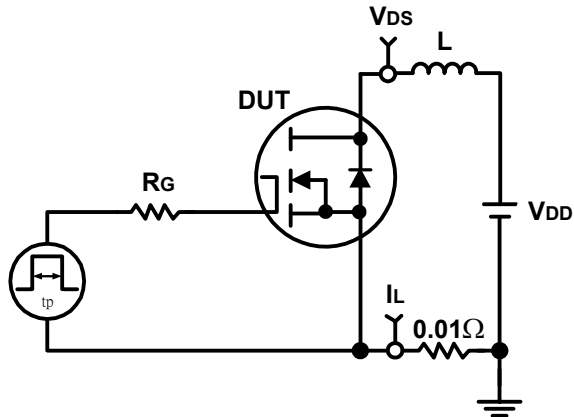
Typical Operating Characteristics(Cont.)

Gate-Source On Resistance

Gate Threshold Voltage

Output Characteristics

Drain-Source On Resistance


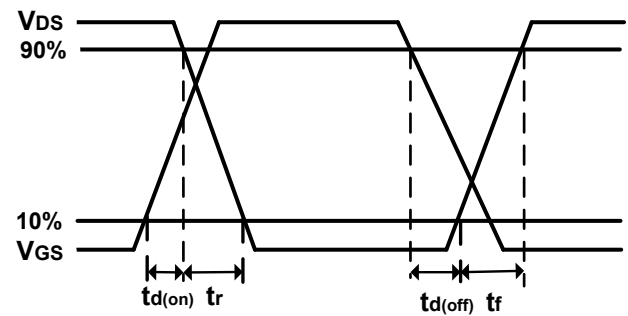
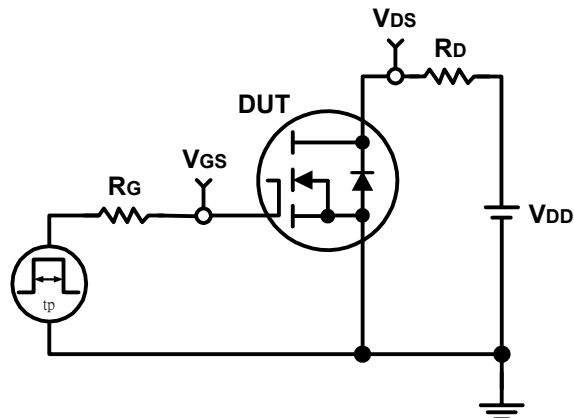
Typical Operating Characteristics(Cont.)

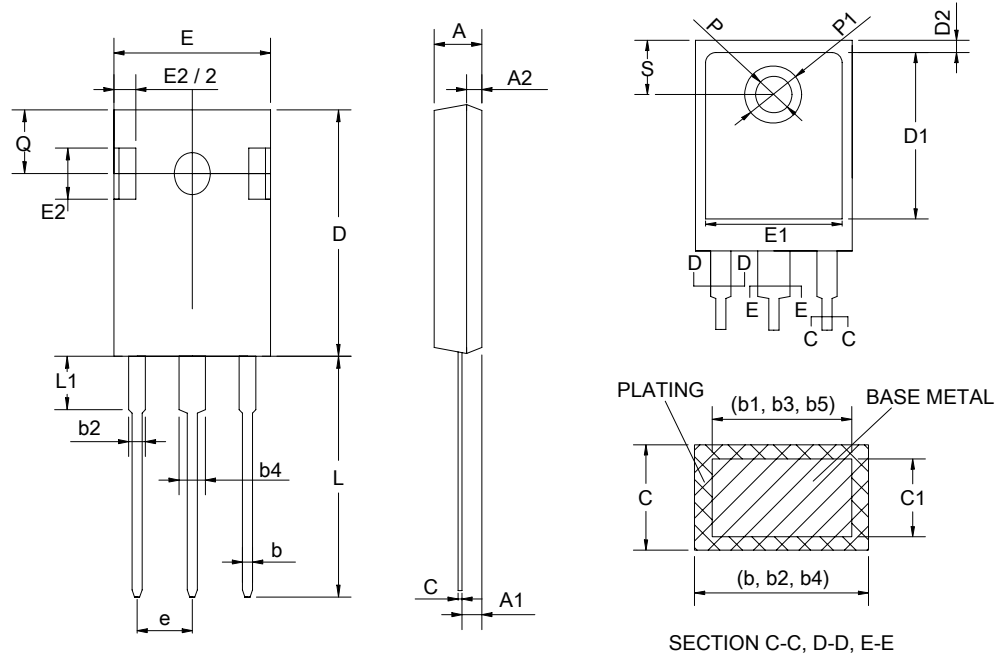
Capacitance

Gate Charge

Drain-Source On Resistance

Source-Drain Diode Forward


Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms





SYMBOL	TO-247			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.7	5.31	0.185	0.209
A1	2.21	2.59	0.087	0.102
A2	1.5	2.49	0.059	0.098
D	20.8	21.46	0.819	0.845
E	15.49	16.26	0.610	0.640
E2	4.32	5.49	0.170	0.216
e	5.46 BSC		0.215 BSC	
L	19.81	20.32	0.780	0.800
L1	-	4.5	-	0.177
P	3.56	3.66	0.140	0.144
Q	5.38	6.2	0.212	0.244
S	6.15 BSC		0.242 BSC	
b	0.99	1.4	0.039	0.055
b1	0.99	1.35	0.039	0.053
b2	1.65	2.39	0.065	0.094
b3	1.65	2.34	0.065	0.092
b4	2.59	3.43	0.102	0.135
b5	2.59	3.38	0.102	0.133
c	0.38	0.89	0.015	0.035
c1	0.38	0.84	0.015	0.033
D1	13.08	-	0.515	-
D2	0.51	1.35	0.020	0.053
E1	13.46	-	0.530	-
P1	-	7.4	-	0.291

RECOMMENDED LAND PATTERN

