

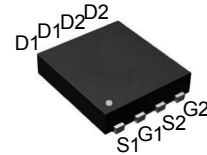
Features

- 30V/16A,
 $R_{DS(ON)} = 16.5m\Omega(\text{typ.}) @ V_{GS} = 10V$
 $R_{DS(ON)} = 21m\Omega(\text{typ.}) @ V_{GS} = 4.5V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

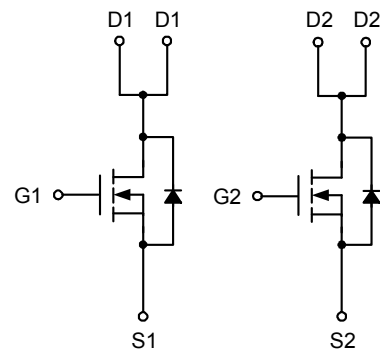
Applications

- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems.

Pin Description



PDFN3.3x3.3-8L



N-Channel MOSFET

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

Symbol	Parameter	Rating	Unit
V_{DSS}	Drain-Source Voltage	30	V
V_{GSS}	Gate-Source Voltage	± 20	
I_D^a	Continuous Drain Current ($V_{GS}=10\text{V}$)	$T_A=25^\circ\text{C}$ 16	A
		$T_A=70^\circ\text{C}$ 9.5	
I_{DM}^a	300 μs Pulsed Drain Current ($V_{GS}=10\text{V}$)	40	
I_S^a	Diode Continuous Forward Current	1	
I_{AS}^b	Avalanche Current (Single Pulse)	9	
E_{AS}^b	Avalanche Energy, Single Pulse ($L=0.5\text{mH}$)	20	mJ
T_J	Maximum Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	
P_D^a	Maximum Power Dissipation	$T_A=25^\circ\text{C}$ 2.4	W
		$T_A=70^\circ\text{C}$ 1.68	
$R_{\theta JA}^a$	Thermal Resistance-Junction to Ambient	$t \leq 10\text{s}$ 45	$^\circ\text{C/W}$
		Steady State 64	
$R_{\theta JL}$	Thermal Resistance-Junction to Lead	Steady State 32	

Note a : Surface Mounted on 1in² pad area, $t \leq 10\text{sec}$. Maximum Power dissipation is calculated from $R_{\theta JA}$ (worst) =62.5 $^\circ\text{C/W}$ under $t \leq 10\text{s}$.

Note b : UIS tested and pulse width limited by maximum junction temperature 150 $^\circ\text{C}$ (initial temperature $T_J=25^\circ\text{C}$).

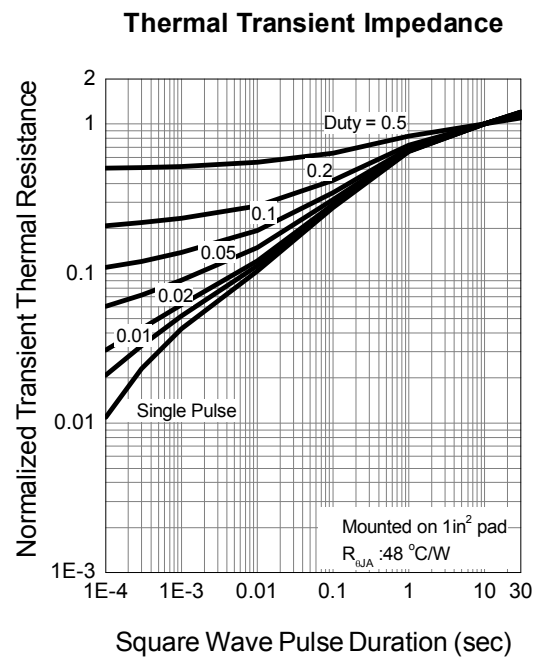
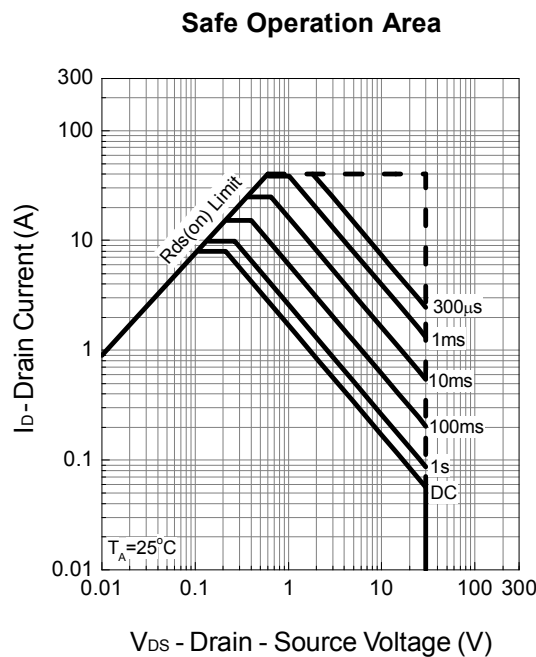
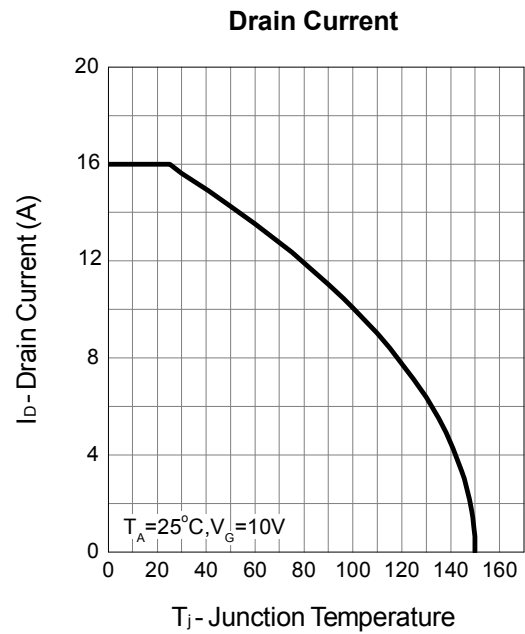
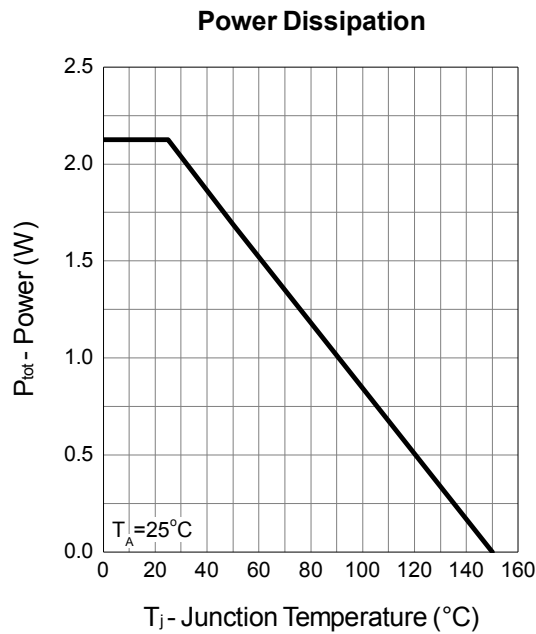
Electrical Characteristics (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	XP3020SM			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V, V _{GS} =0V	-	-	1	μA
		T _J =85°C	-	-	30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.0	1.5	2.0	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^a	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =16A	-	16.5	19	mΩ
		V _{GS} =4.5V, I _{DS} =10A	-	21	25	
Gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =8A	-	32	-	S
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} =1A, V _{GS} =0V	-	0.7	1.1	V
t _{rr} ^b	Reverse Recovery Time	I _{SD} =8A, dI _{SD} /dt=100A/μs	-	15.5	-	ns
Q _{rr} ^b	Reverse Recovery Charge		-	6.5	-	nC
Dynamic Characteristics ^b						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	1.3	1.7	2.3	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Frequency=1.0MHz	-	580	-	pF
C _{oss}	Output Capacitance		-	95	-	
C _{rss}	Reverse Transfer Capacitance		-	57	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =15V, R _L =15Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	5.9	10	ns
t _r	Turn-on Rise Time		-	10	17	
t _{d(OFF)}	Turn-off Delay Time		-	17	35	
t _f	Turn-off Fall Time		-	4	9	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _{DS} =8A	-	10.2	14	nC
	Total Gate Charge	V _{DS} =15V, V _{GS} =4.5V, I _{DS} =8A	-	5.3	7.5	
Q _{gth}	Threshold Gate Charge		-	0.78	-	
Q _{gs}	Gate-Source Charge		-	1.7	-	
Q _{gd}	Gate-Drain Charge		-	2.2	-	

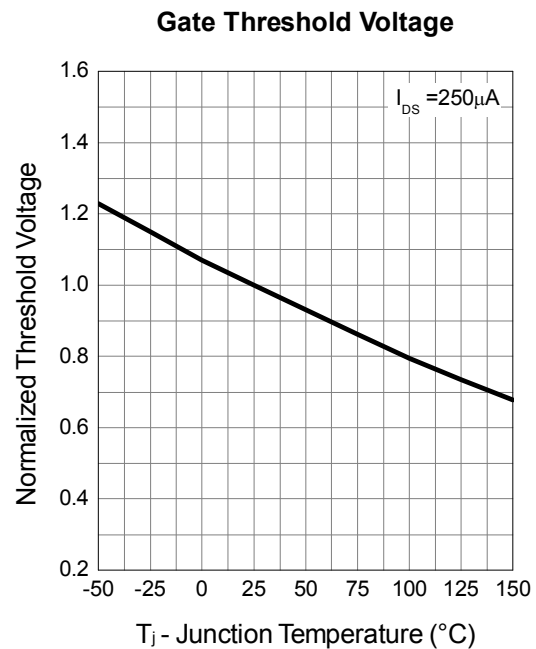
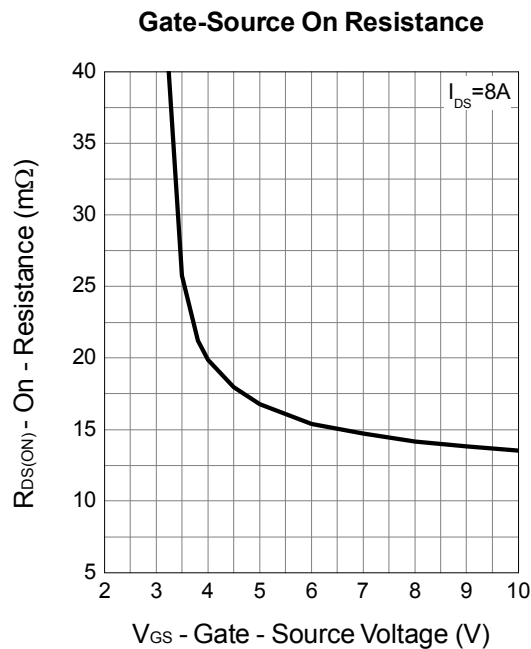
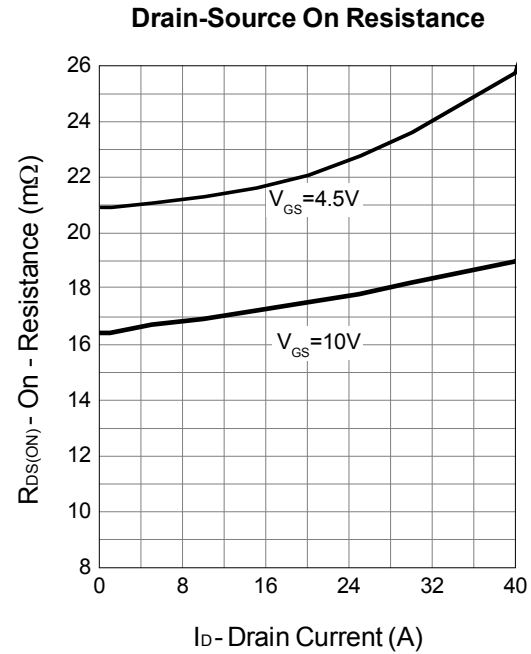
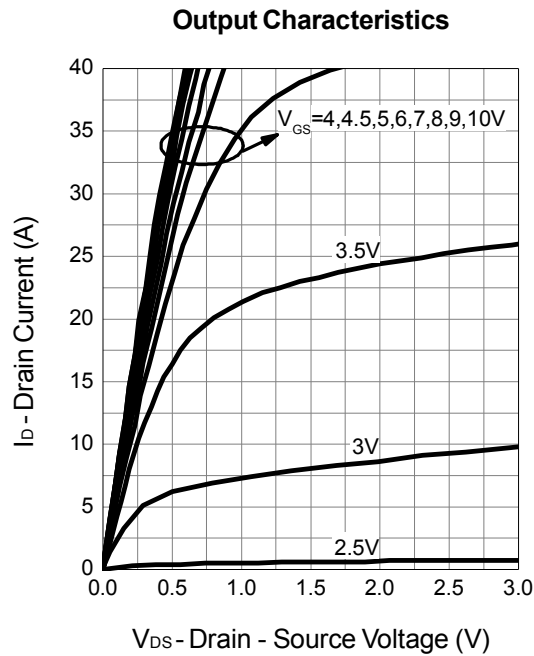
Note a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2%.

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

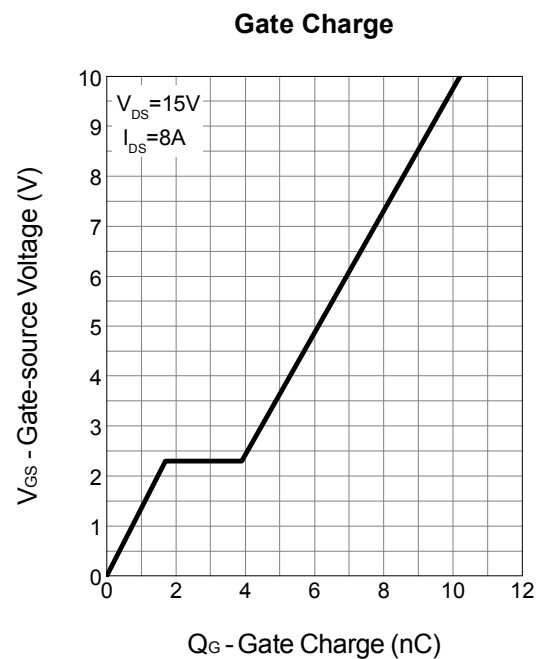
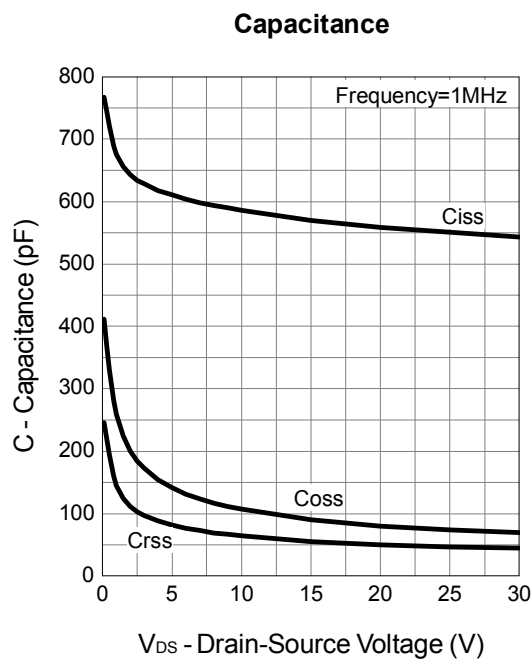
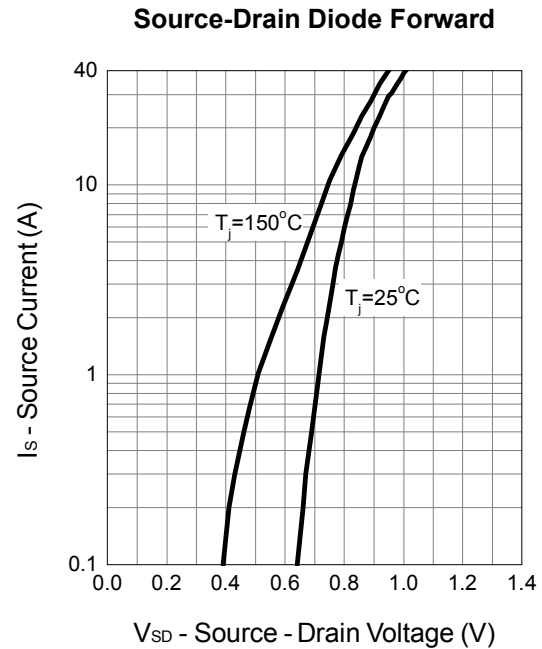
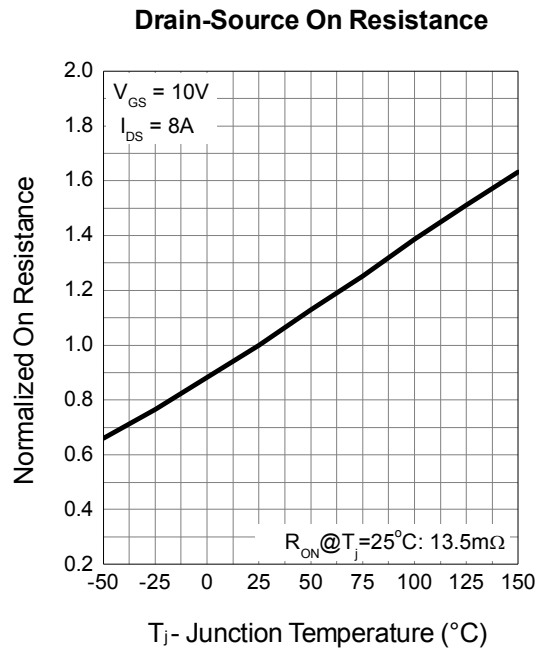
Typical Operating Characteristics



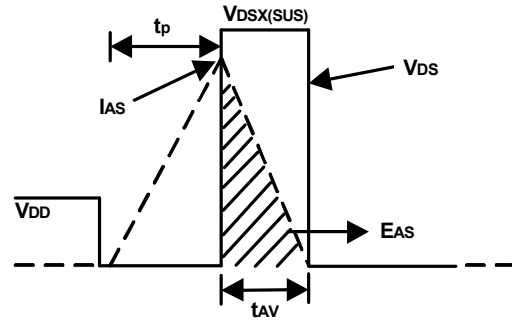
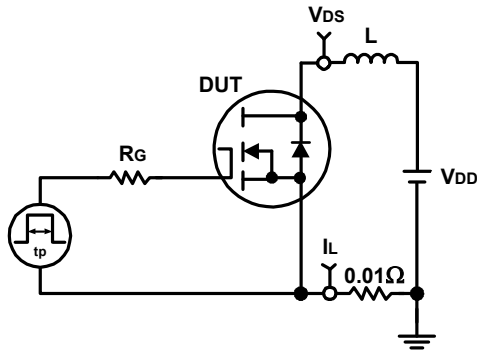
Typical Operating Characteristics (Cont.)



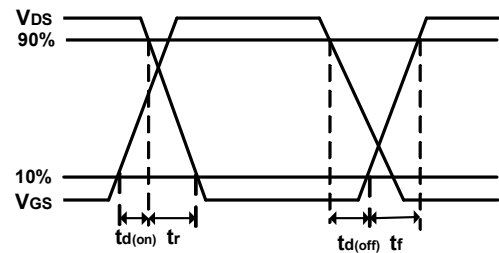
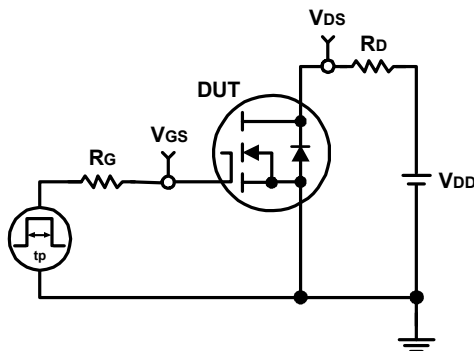
Typical Operating Characteristics (Cont.)



Avalanche Test Circuit and Waveforms

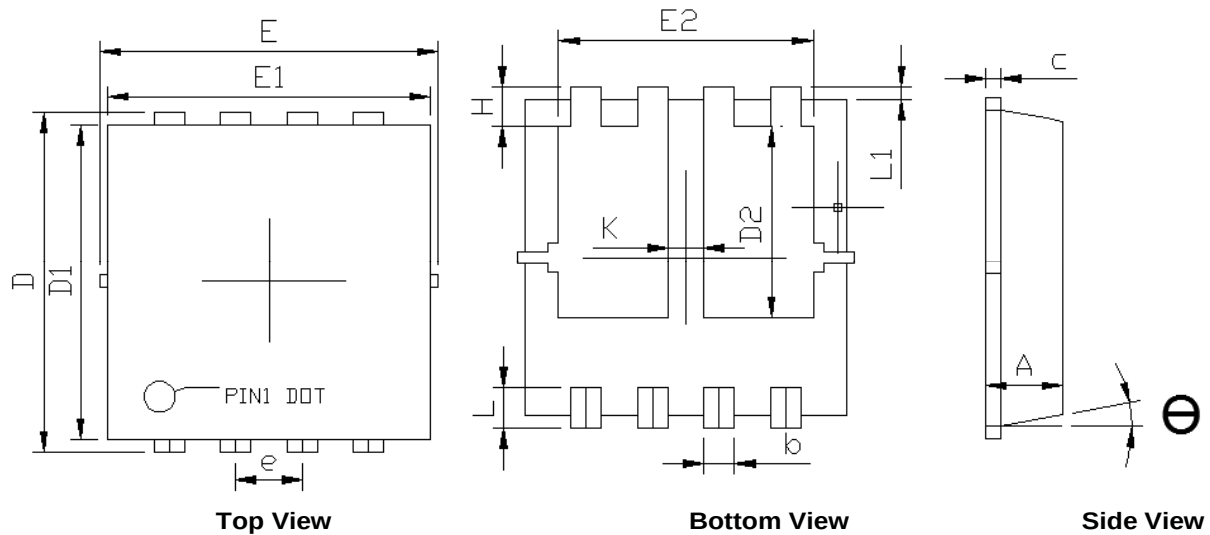


Switching Time Test Circuit and Waveforms



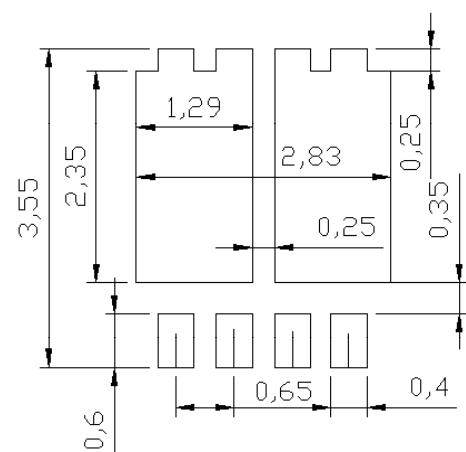
Package Information

PDFN3.3x3.3-8L



SYMBOLS	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	0.80	0.028	0.031
b	0.25	0.35	0.010	0.014
c	0.10	0.25	0.004	0.010
D	3.25	3.45	0.128	0.136
D1	3.00	3.20	0.118	0.126
D2	1.78	1.98	0.070	0.078
E	3.20	3.40	0.126	0.134
E1	3.00	3.20	0.118	0.126
E2	2.39	2.59	0.094	0.102
e	0.65BSC		0.026 BSC	
H	0.30	0.50	0.012	0.020
L	0.30	0.50	0.012	0.020
L1	0.13 REF		0.005 REF	
K	0.30	-	0.012	-
θ	-	12°	-	12°

RECOMMENDED LAND PATTERN



UNIT: mm