



-20V/-4A P-Channel Advanced Power MOSFET

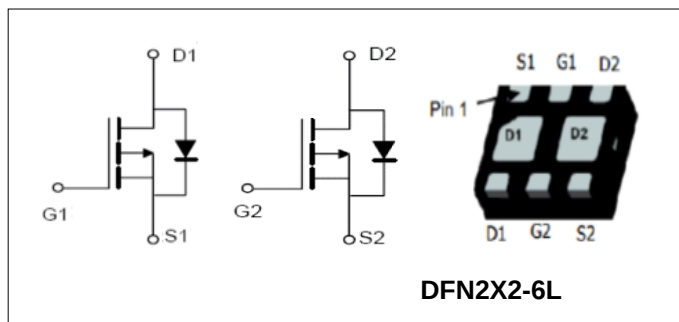
Features

- Improved dv/dt Capability, High Ruggedness.
- Maximum Junction Temperature Range (150°C)

Applications

- Battery protection
- Load switch
- Power management

BVDSS	-20	V
ID	-4	A
RDSON@VGS=-4.5V	34	mΩ
RDSON@VGS=-2.5V	48	mΩ
RDSON@VGS=-1.8V	65	mΩ



Order Information

Product	Package	Marking	Reel Size	Reel	Carton
PTM20P04D	DFN2X2-6L	PTM20P04D	7inch	3000PCS	120000PCS

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit	
Common Ratings (TC=25°C Unless Otherwise Noted)					
V _{(BR)DSS}	Drain-Source Breakdown Voltage		-20	V	
V _{GS}	Gate-Source Voltage		±12	V	
T _J	Maximum Junction Temperature		150	°C	
T _{STG}	Storage Temperature Range		-55 to 150	°C	
I _S	Diode Continuous Forward Current	TA =25°C	-4	A	
Mounted on Large Heat Sink					
I _{DM}	Pulse Drain Current Tested (Silicon Limit)	(Note1)	TA =25°C	-15	A
I _D	Continuous Drain current		TA =25°C	-4	A
P _D	Maximum Power Dissipation		TA =25°C	1.4	W
R _{θJA}	Thermal Resistance Junction-to-Ambient		(Note2)	89.3	°C/W

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Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain- Source Breakdown Voltage	VGS=0V ID=-250μA	-20	--	--	V
I _{DSS}	Zero Gate Voltage Drain current	VDS=-20V,VGS=0V	--	--	-1	μA
I _{GSS}	Gate-Body Leakage Current	VGS=±12V,VDS=0V	--	--	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	VDS=VGS,ID=-250μA	-0.45	-0.67	-0.9	V
R _{DS(ON)}	Drain-Source On-State Resistance (Note3)	VGS=-4.5V, ID=-4A	--	34	46	mΩ
		VGS=-2.5V, ID=-3A	--	48	57	mΩ
		VGS=-1.8V, ID=-2.5A	--	65	90	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated) (Note4)						
C _{iss}	Input Capacitance	VDS= -10V, VGS=0V, F=1MHz	--	592	--	pF
C _{oss}	Output Capacitance		--	73	--	pF
C _{rss}	Reverse Transfer Capacitance		--	63	--	pF
Q _g	Total Gate Charge	VDS= -10V, ID= -4A, VGS= -4.5V	--	7.7	--	nC
Q _{gs}	Gate-Source Charge		--	1.1	--	nC
Q _{gd}	Gate-Drain Charge		--	1.9	--	nC
Switching Characteristics (Note4)						
t _{d(on)}	Turn-on Delay Time	VDD=-10V, ID=-4A, RG=3Ω, VGS=-4.5V	--	6.5	--	nS
t _r	Turn-on Rise Time		--	32	--	nS
t _{d(off)}	Turn-off Delay Time		--	47	--	nS
t _f	Turn-off Fall Time		--	50	--	nS
Source- Drain Diode Characteristics@ TJ = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage (Note3)	IS=-1.6A,VGS=0V	--	--	-1.2	V

Note:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec
3. Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.



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Typical Characteristics

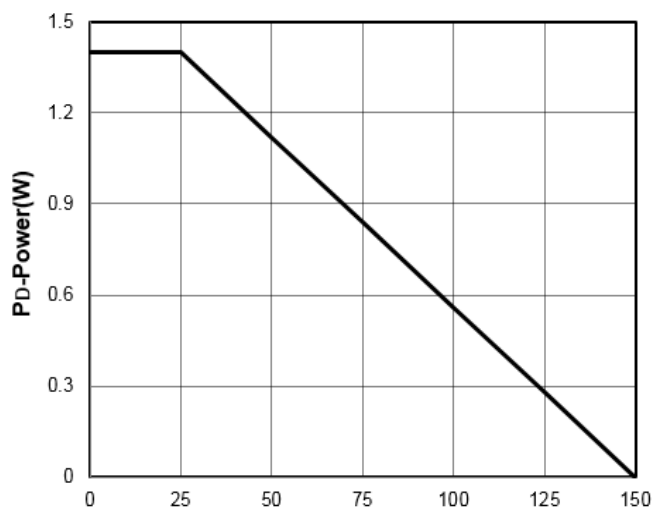


Figure1: T_j Junction Temperature (°C)

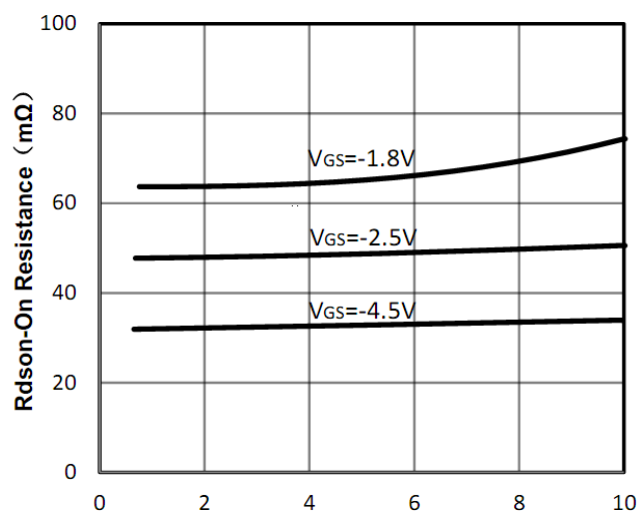


Figure2: -I_d Drain Current (A)

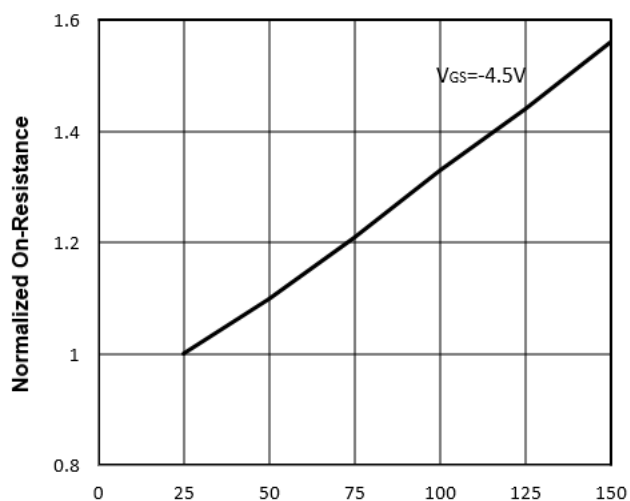


Figure3: T_j Junction Temperature (°C)

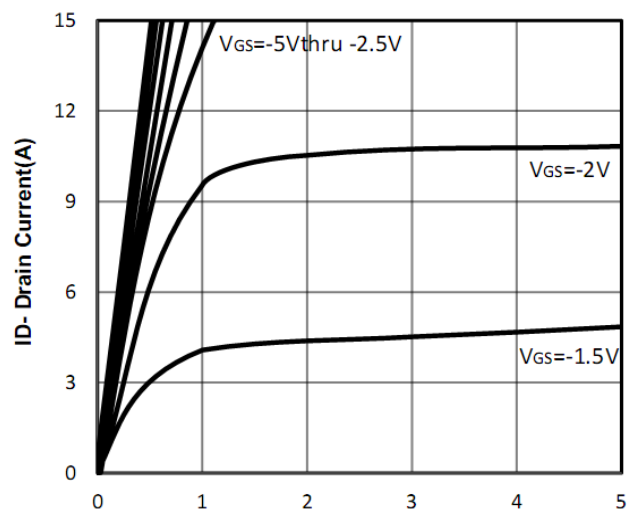


Figure4: -V_{DS} Drain-Source Voltage (V)

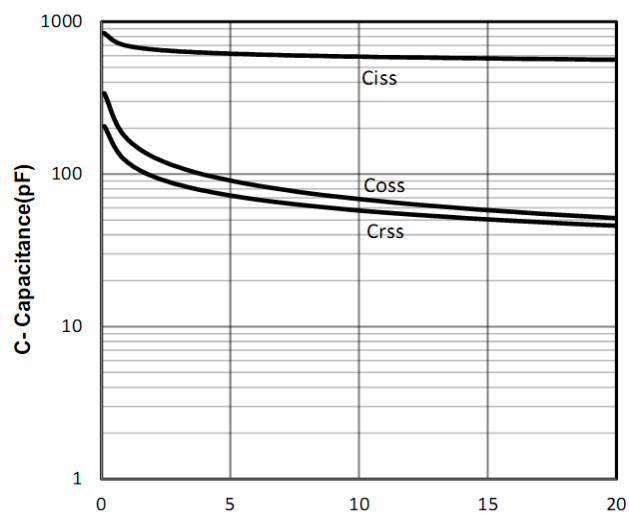


Figure5: -V_{DS} Drain-Source Voltage (V)

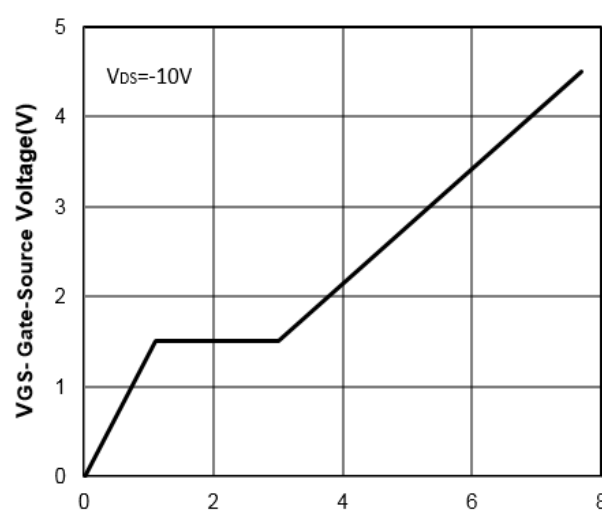


Figure6: Q_g Gate Charge (nC)



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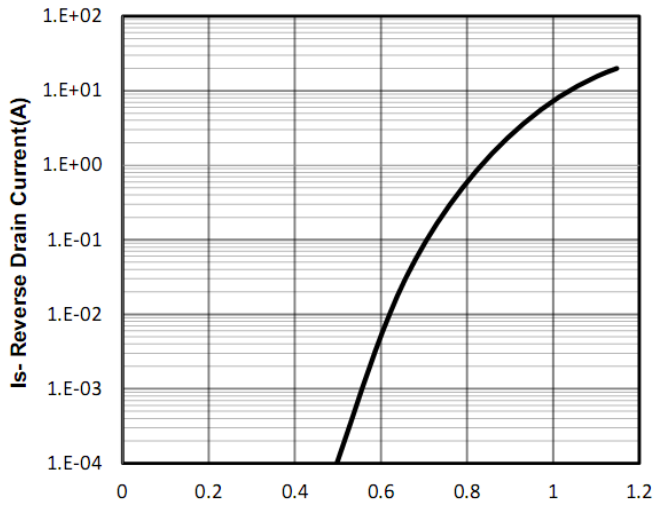


Figure7: -Vsd Source Drain Voltage (V)

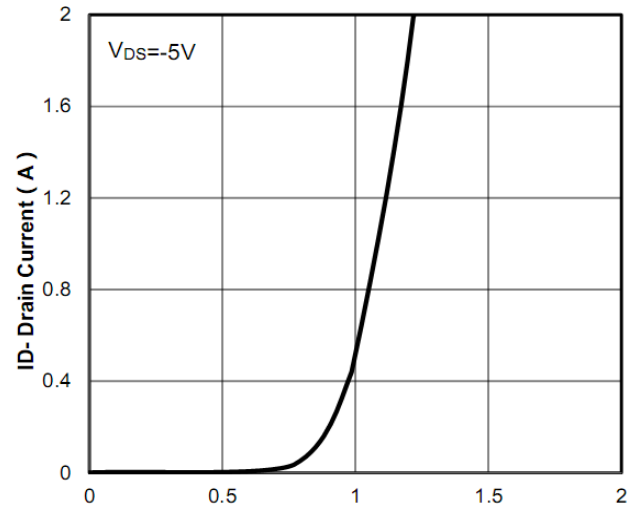


Figure8: -Vgs Gate-Source Voltage (V)

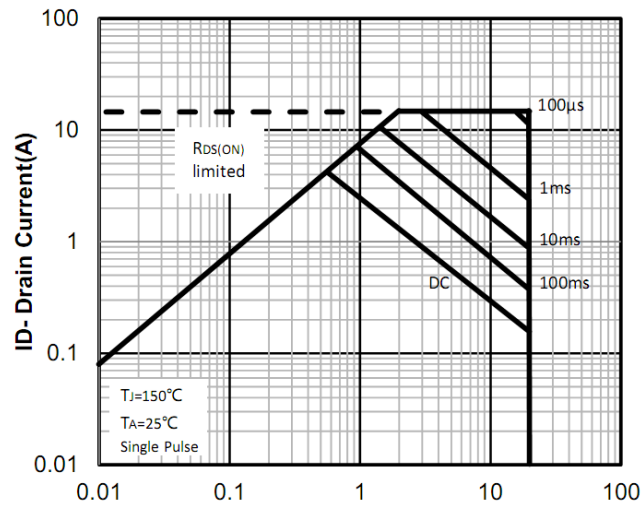


Figure9: -VDS Drain Source Voltage (V)

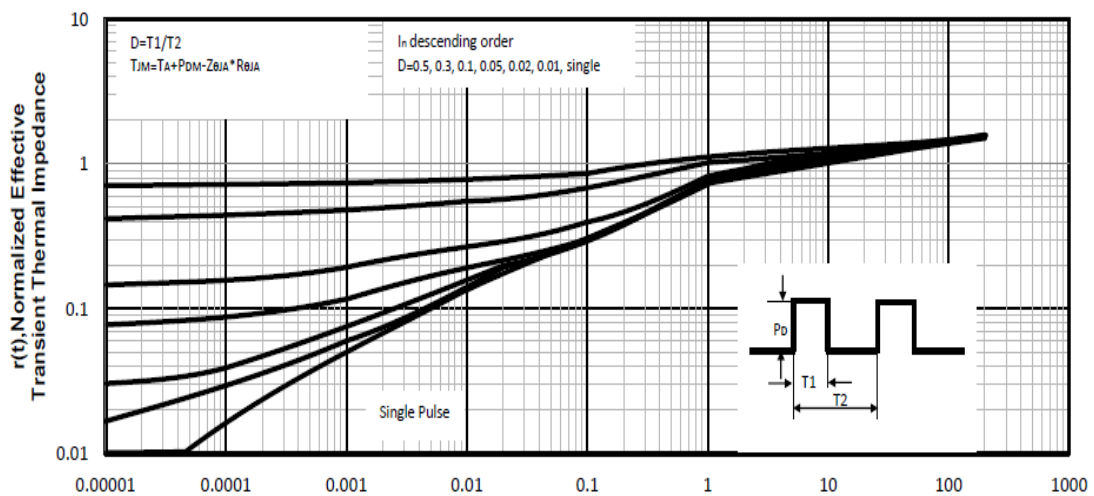


Figure10: Square Wave Pulse Duration (sec)



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Test Circuit and Waveform:

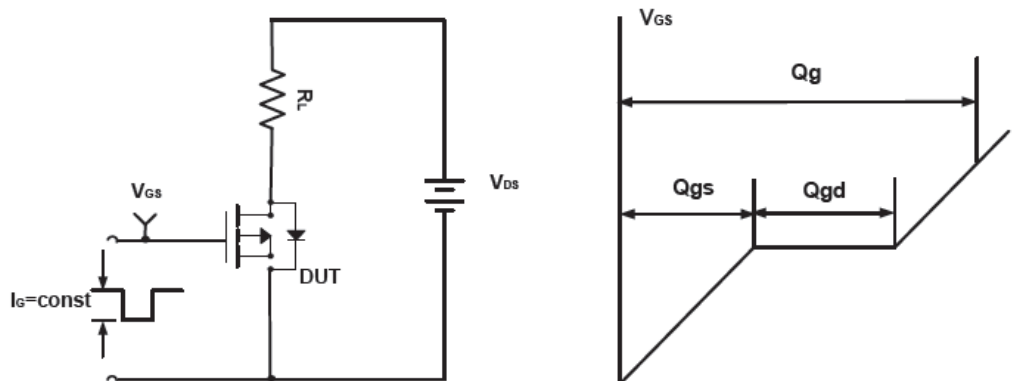


Figure A Gate Charge Test Circuit & Waveforms

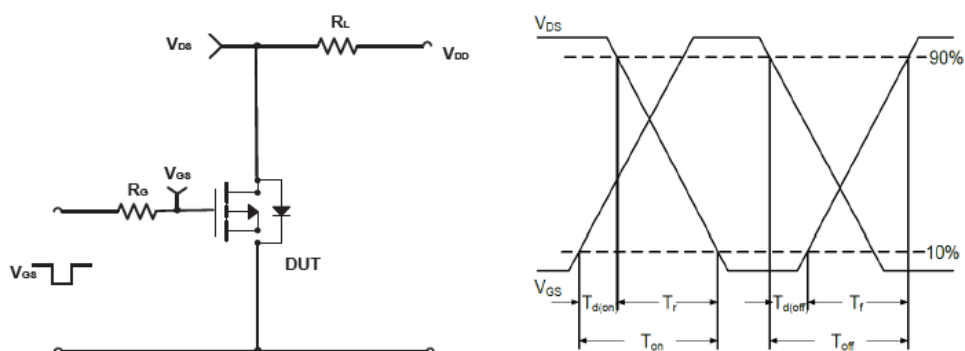


Figure B Switching Test Circuit & Waveforms

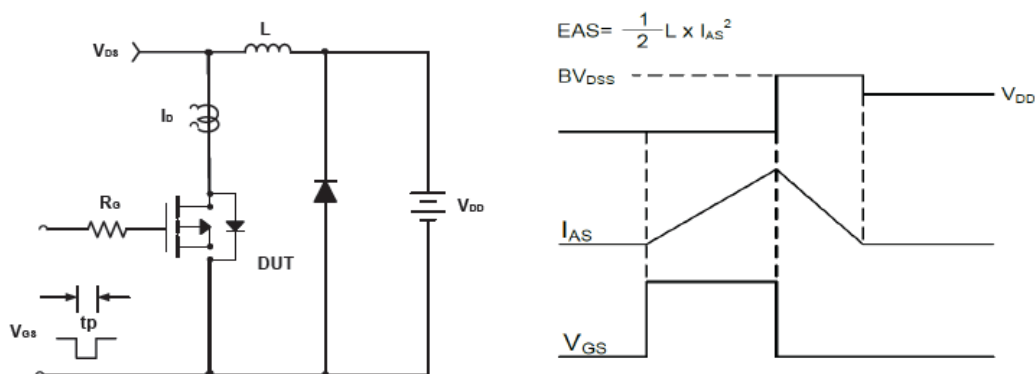
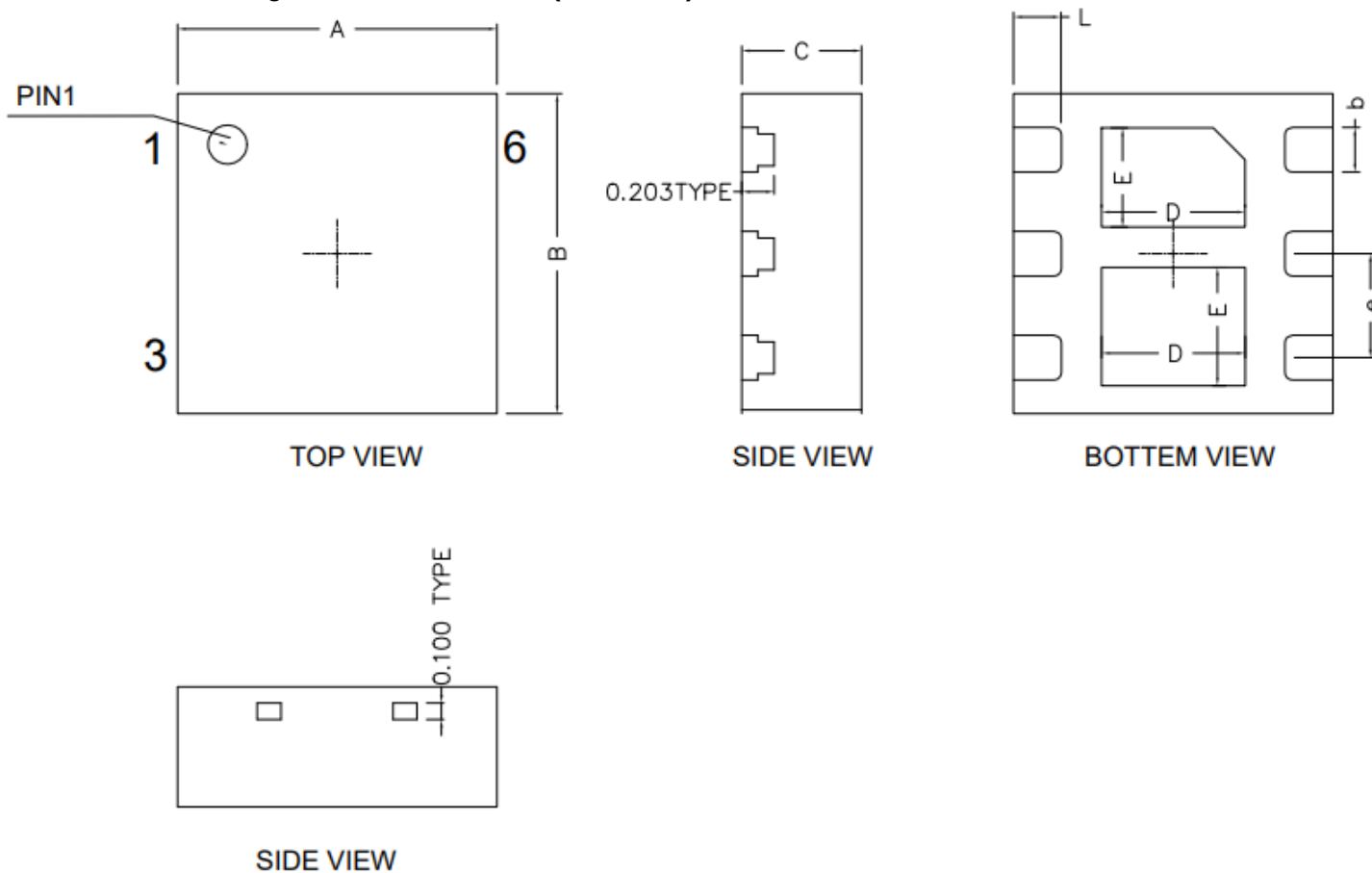


Figure C Unclamped Inductive Switching Circuit & Waveforms



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DFN2X2-6L Package Outline Dimensions (Units: mm)



COMMON DIMENSIONS
(UNITS OF MEASURE IS mm)

	MIN	NORMAL	MAX
A	1.900	2.000	2.100
B	1.900	2.000	2.100
C	0.700	0.750	0.800
D	0.850	0.900	0.950
E	0.690	0.740	0.790
L	0.250	0.300	0.350
b	0.230	0.280	0.330
e	0.650 TYPE		