N-Channel 150 V (D-S) MOSFET

RoHS COMPLIANT

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (mΩ) (Typ.)	I_D (A)[a]	Q_g (Typ.)
150	240 at V_{GS} = 10 V	10	13.2 nC

FEATURES

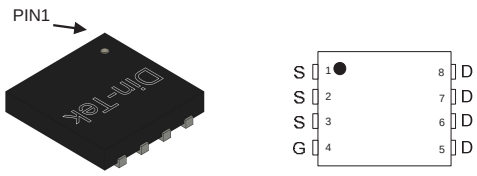
- DT-Trench Power MOSFET
- 100 % R_g and UIS tested
- Fast Switching
- Low Gate Charge

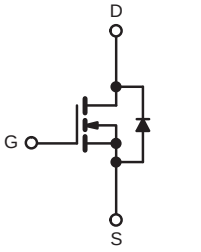
APPLICATIONS

- DC-DC Converter
- Power Management

PDFN3.3X3.3-8L Pin Configuration

Top View





N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)				
PARAMETER		**SYMBOL**	**LIMIT**	**UNIT**
Drain-Source Voltage		V_{DS}	150	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (T_J = 150 °C)[a]	T_C = 25 °C	I_D	10	A
	T_C = 100 °C		6.3	
Pulsed Drain Current[b]		I_{DM}	40	
Single Avalanche Energy		E_{AS}	28.8	mJ
Maximum Power Dissipation[c]	T_C = 25 °C	P_D	30	W
	T_C = 100 °C		12	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to +150	°C

THERMAL RESISTANCE RATINGS			
PARAMETER	**SYMBOL**	**LIMIT**	**UNIT**
Junction-to-Ambient (PCB Mount)[d]	R_{thJA}	65	°C/W
Junction-to-Case (Drain)	R_{thJC}	4.16	

Notes

a. Calculated continuous current based on maximum allowablejunction temperature.
b. Repetitive rating; pulse width limited by max. junction temperature.
c. Pd is based on max. junction temperature, using junction-case thermal resistance.
d. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper,in a still air environment with Ta=25 °C.

SPECIFICATIONS (T_C = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	150	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	1.4	-	2.4	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 150 V, V_{GS} = 0 V	-	-	1	µA
		V_{DS} = 120 V, V_{GS} = 0 V, T_J = 100 °C	-	-	100	
On-State Drain Current [a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 10 V	10	-	-	A
Drain-Source On-State Resistance [a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 5 A	-	240	290	mΩ
Forward Transconductance [a]	g_{fs}	V_{DS} = 5 V, I_D = 5 A	-	18	-	S
Dynamic [b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 75 V, f = 1 MHz	-	425	-	pF
Output Capacitance	C_{oss}		-	17	-	
Reverse Transfer Capacitance	C_{rss}		-	11	-	
Total Gate Charge [c]	Q_g	V_{DS} = 75 V,V_{GS} = 10 V, I_D = 10 A	-	13.2	-	nC
Gate-Source Charge [c]	Q_{gs}		-	2.4	-	
Gate-Drain Charge [c]	Q_{gd}		-	3.7	-	
Gate Resistance	R_g	f = 1 MHz	-	1.36	-	Ω
Turn-On Delay Time [c]	$t_{d(on)}$	V_{DD} = 75 V, I_D = 1 A,R_g = 5 Ω V_{GS} = 10 V	-	8.5	-	ns
Rise Time [c]	t_r		-	10	-	
Turn-Off Delay Time [c]	$t_{d(off)}$		-	21	-	
Fall Time [c]	t_f		-	14.5	-	
Drain-Source Body Diode Ratings and Characteristics [b] (T_C = 25 °C)						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C	-	-	10	A
Pulsed Current	I_{SM}		-	-	40	A
Forward Voltage [a]	V_{SD}	I_F = 5 A, V_{GS} = 0 V	-	-	1.2	V

Notes

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

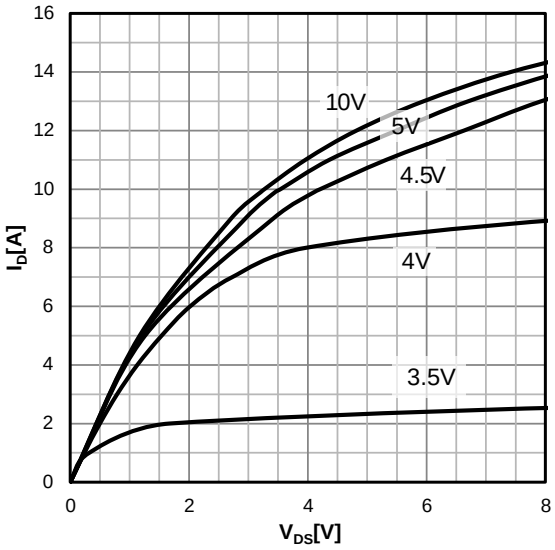
b. Guaranteed by design, not subject to production testing.

c. Independent of operating temperature.

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.

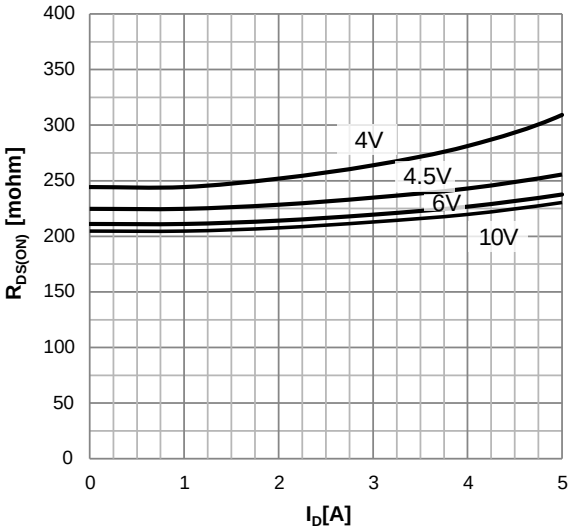
TYPICAL CHARAC TERISTICS (25 °C, unless otherwise noted)

Figure 1: Typ. output characteristics



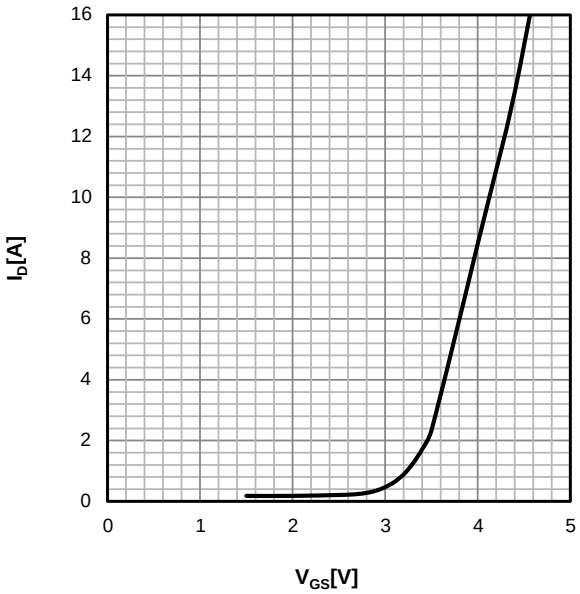
$I_D=f(V_{DS})$, T_j=25 °C; parameter: V_{GS}

Figure 2: Typ. drain-source on resistance



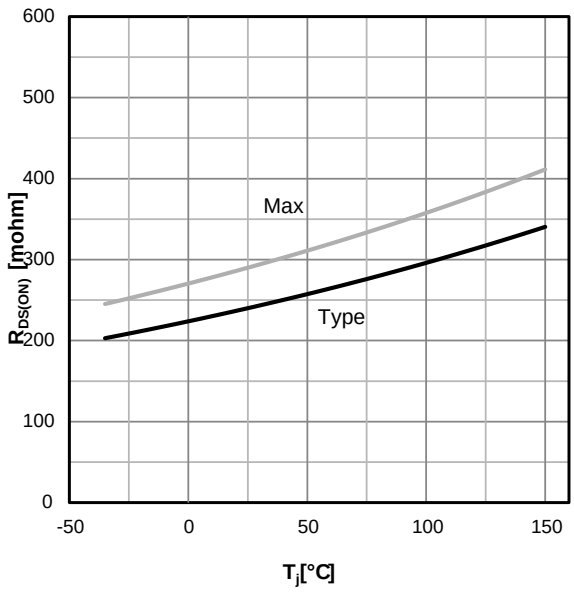
$R_{DS(on)}=f(I_D)$, T_j=25 °C; parameter: V_{GS}

Figure 3: Typ. transfer characteristics



$I_D=f(V_{GS})$, $|V_{DS}|>2|I_D|R_{DS}(on)max$;

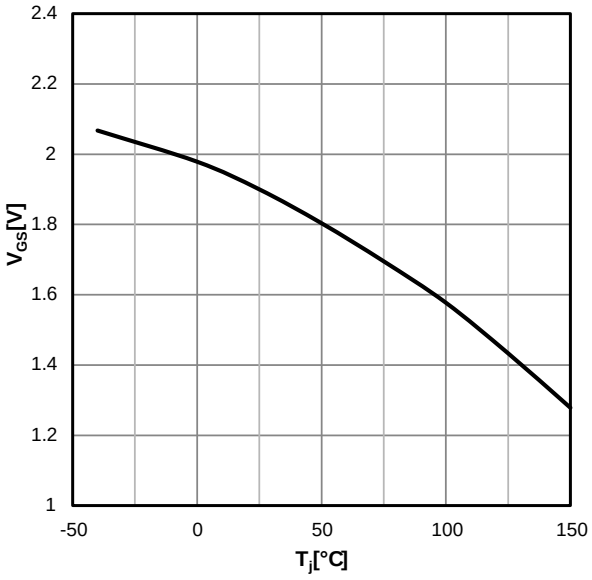
Figure 4: drain-source on resistance



$R_{DS(on)}=f(T_j)$, I_D=5.0A, V_{GS}=10V;

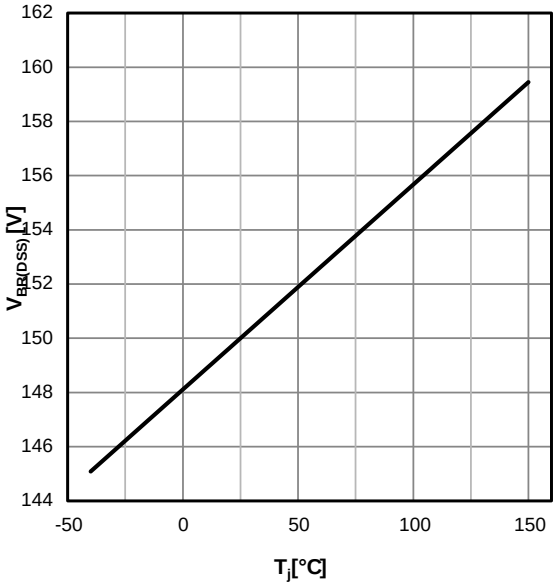
TYPICAL CHARAC TERISTICS (25 °C, unless otherwise noted)

Figure 5: Typ. gate threshold voltage



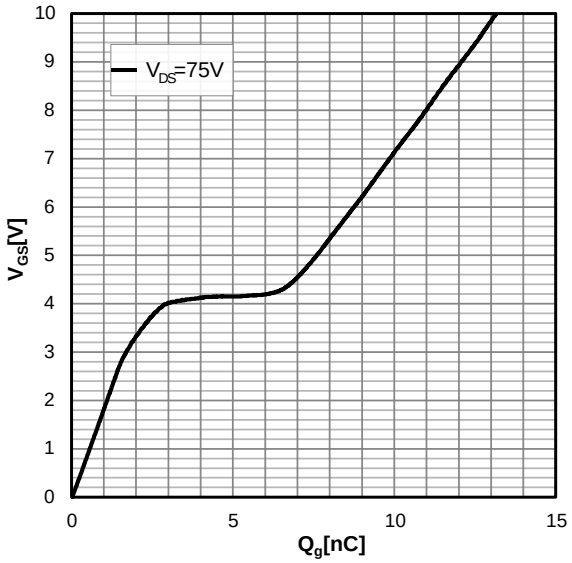
$V_{GS}=f(T_j)$,I $V_{GS}=V_{DS,}I_D=250\mu A$;

Figure 6: Drain-source breakdown voltage



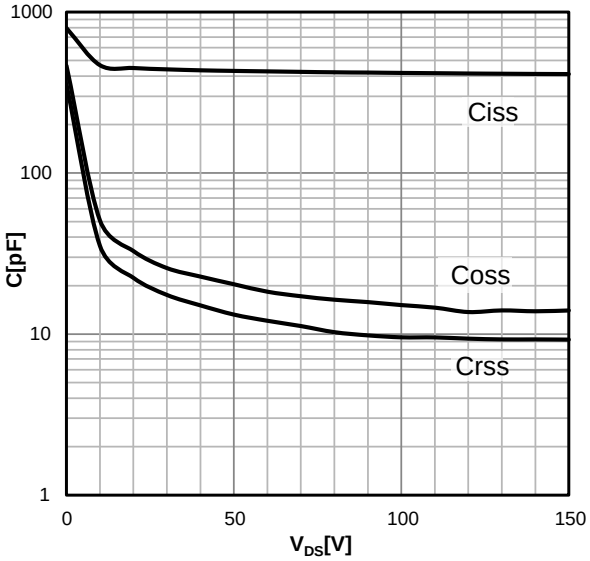
$V_{BR(DSS)}=f(T_j)$; $I_D=250\mu A$;

Figure 7: Typ. gate charge



$V_{GS}=f(Q_g)$, $I_D=10A$, $T_j=25$ °C; parameter: V_{DS}

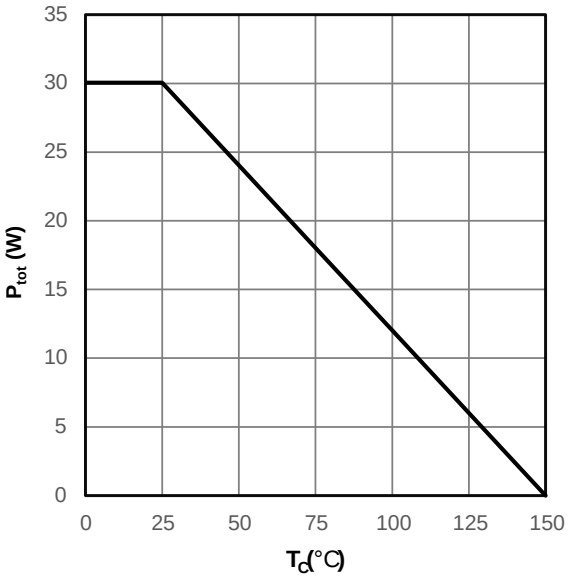
Figure 8: Typ. Capacitances



C=f(V_{DS}); V_{GS}=0V; f=1.0 MHz;

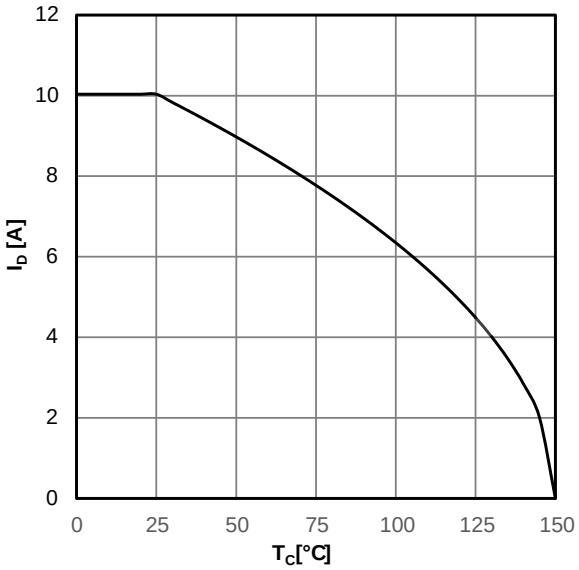
TYPICAL CHARAC TERISTICS (25 °C, unless otherwise noted)

Figure 9: Power dissipation



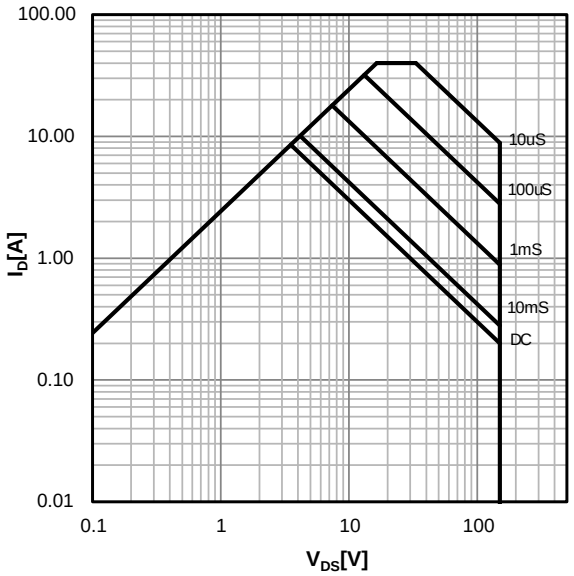
$P_{tot}=f(T_C)$;

Figure 10:Drain current



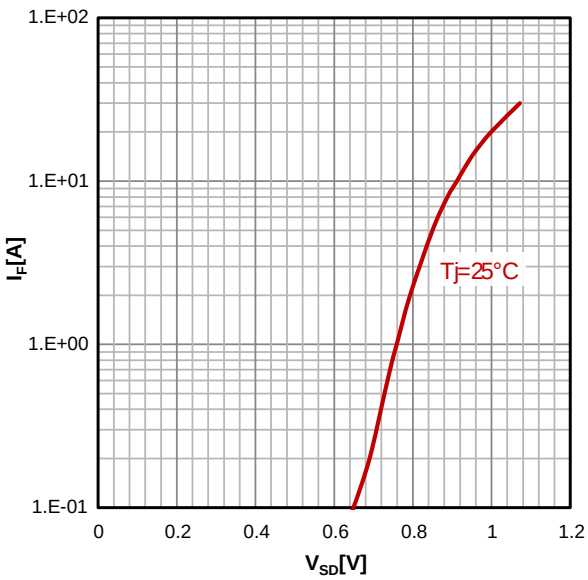
$I_D=f(T_C)$;

Figure 11: Safe operating area



$I_D=f(V_{DS})$; $T_C=25$ °C; D=0; parameter: tp

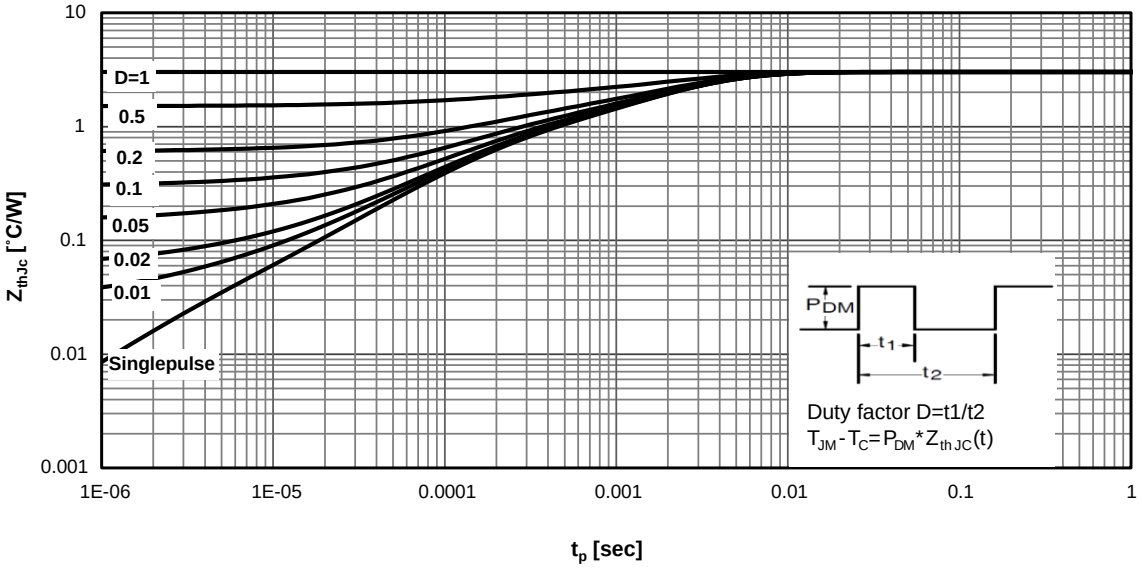
Figure 12: Typ. forward characteristics



$I_F=f(V_{SD})$;

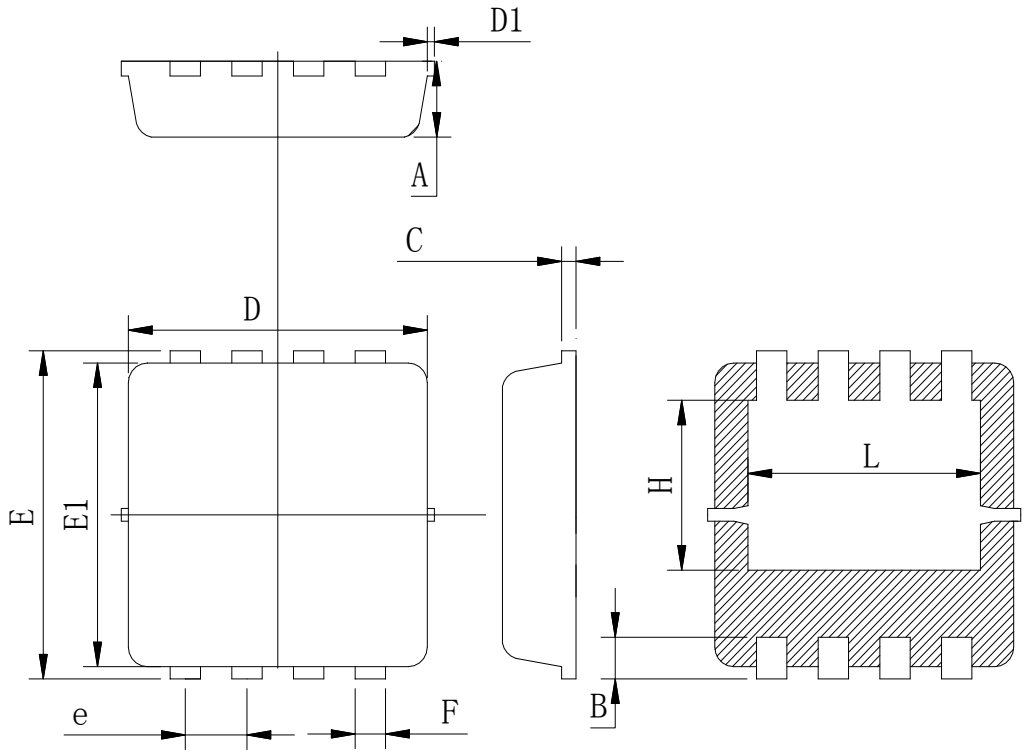
TYPICAL CHARAC TERISTICS (25 °C, unless otherwise noted)

Figure 13: Max. Transient Thermal Impedance



$Z_{thJC}=f(t_p)$; parameter: D

PDFN 3.3X3.3 PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

Symbol	Min	Typ	Max
A	0.600	0.775	1.000
B	0.20	0.38	0.55
C	0.05	0.15	0.40
D	3.10	3.25	3.50
D1	-	-	0.15
E	3.15	3.35	3.50
E1	2.60	3.10	3.45
e	0.50	0.65	0.80
F	0.15	0.32	0.45
H	1.25	1.73	2.10
L	2.20	2.45	2.85

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