



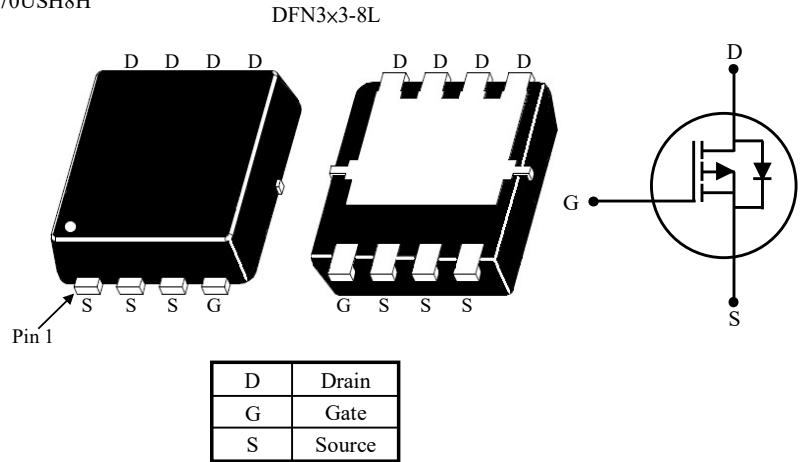
STM302P070USH8H

P-Channel Enhancement Mode Field Effect Transistor

FEATURES

- Low $R_{DS(on)}$
- Suffix "H" indicates Halogen-free parts, ex.STM302P070USH8H

PIN CONFIGURATION



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

Parameter	Symbol	Value	Unit	
Drain-Source Voltage	V_{DS}	-20	V	
Gate-Source Voltage	V_{GS}	± 12		
Drain Current	I_D	$T_C = 25\text{ }^\circ\text{C}$	-60.0	A
		$T_C = 100\text{ }^\circ\text{C}$	-37.8	
Pulsed Drain Current (Note 1)	I_{DM}	-180	A	
Avalanche Current	I_{AS}	-29	A	
Avalanche Energy (Note 2)	E_{AS}	42	mJ	
Power Dissipation	P_D	35.7	W	
Thermal Resistance from Junction to Ambient (Note 3)	$R_{\theta JA}$	45	$^\circ\text{C}/\text{W}$	
Thermal Resistance from Junction to Case	$R_{\theta JC}$	3.5	$^\circ\text{C}/\text{W}$	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to + 150	$^\circ\text{C}$	

Note:

1. The data tested by pulsed, pulse width $\leq 100\mu\text{s}$, duty cycle $\leq 2\%$, Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150\text{ }^\circ\text{C}$
2. Limited by $T_{J(MAX)}$, starting $T_J = 25\text{ }^\circ\text{C}$, $L = 0.1\text{mH}$, $R_g = 25\Omega$, $I_{AS} = -29\text{A}$, $V_{GS} = -10\text{V}$.
3. Device mounted on FR-4 substrate PC board, 2oz copper, with 1 inch² copper plate in still air.



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

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$I_D = -250\mu\text{A}$	$V_{(BR)DSS}$	-20	-	-	V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$	$V_{GS(th)}$	-0.3	-	-1.0	V
Zero Gate Voltage Drain Current	$V_{DS} = -16\text{V}$	I_{DSS}	-	-	-1	μA
Gate Leakage Current	$V_{GS} = \pm 12\text{V}$	I_{GSS}	-	-	± 100	nA
Drain-Source On-Resistance	$V_{GS} = -10\text{V}, I_D = -15\text{A}$	$R_{DS(on)}$	-	5.2	7.0	m Ω
	$V_{GS} = -4.5\text{V}, I_D = -8\text{A}$		-	6.5	8.0	
	$V_{GS} = -2.5\text{V}, I_D = -5\text{A}$		-	9.5	12.0	
Forward Transconductance	$V_{DS} = -5\text{V}, I_D = -8\text{A}$	g_{FS}	-	36	-	S
Dynamic						
Gate Resistance	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$	R_g	-	2	-	Ω
Total Gate Charge	$V_{DS} = -10\text{V}, V_{GS} = -4.5\text{V}, I_D = -15\text{A}$	Q_g	-	47	-	nC
Gate-Source Charge		Q_{gs}	-	9	-	
Gate-Drain Charge		Q_{gd}	-	13	-	
Input Capacitance		C_{iss}	-	4596	-	
Output Capacitance	$V_{DS} = -10\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$	C_{oss}	-	546	-	pF
Reverse Transfer Capacitance		C_{rss}	-	449	-	
Turn on Delay Time	$V_{DD} = -10\text{V}, I_D = -15\text{A}$ $V_{GS} = -10\text{V}, R_g = 3.3\Omega$	$t_{d(on)}$	-	28	-	ns
Turn on Rise Time		t_r	-	67	-	
Turn off Delay Time		$t_{d(off)}$	-	41	-	
Turn off Fall Time		t_f	-	5	-	
Drain-Source Body Diode						
Diode Forward Voltage	$V_{GS} = 0\text{V}, I_S = -1\text{A}$	V_{SD}	-	-	-1.2	V
Diode Continuous Forward Current	-	I_S	-	-	-60	A
Diode Pulse Current	-	I_{SM}	-	-	-180	A
Reverse Recovery Time	$I_S = -15\text{A}, di/dt = 100\text{A}/\mu\text{s}$	t_{rr}	-	17	-	ns
Reverse Recovery Charge		Q_{rr}	-	7.8	-	nC



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RATINGS AND CHARACTERISTIC CURVES

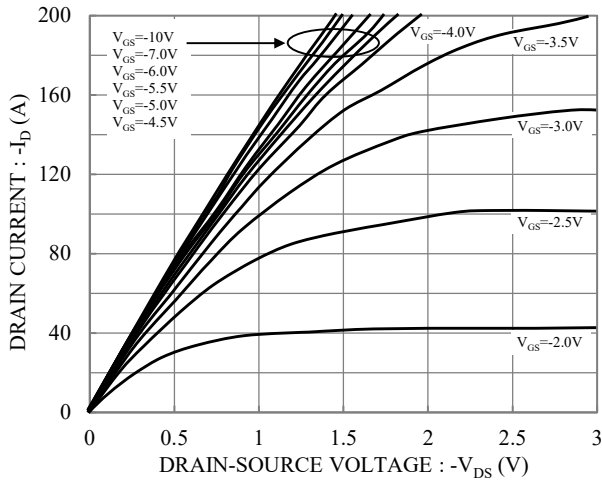


Fig.1 Typical Output Characteristics

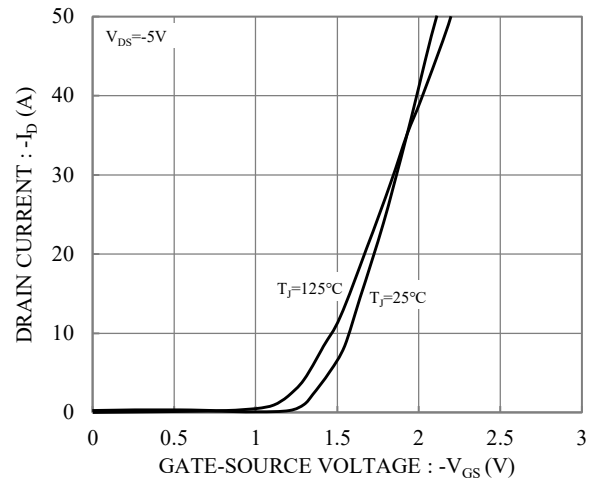


Fig.2 Typical Transfer Characteristics

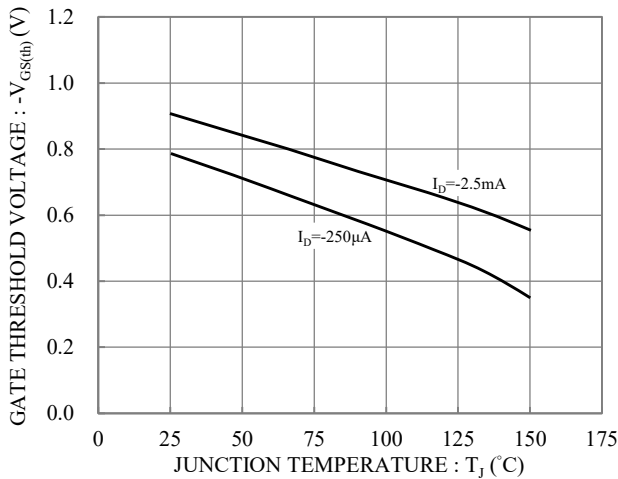


Fig.3 Gate Threshold Voltage vs. Junction Temperature

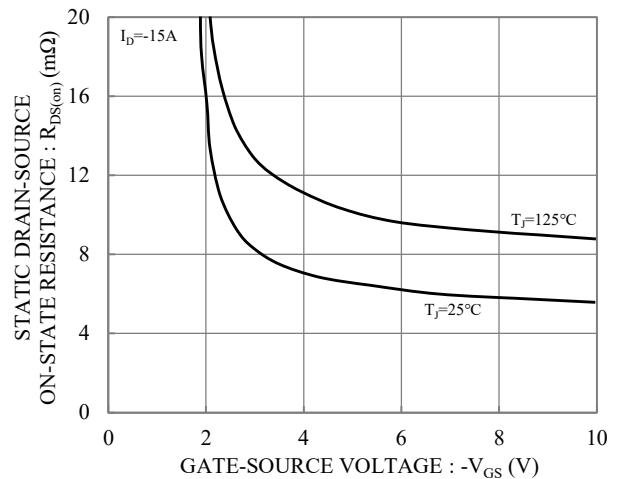


Fig.4 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

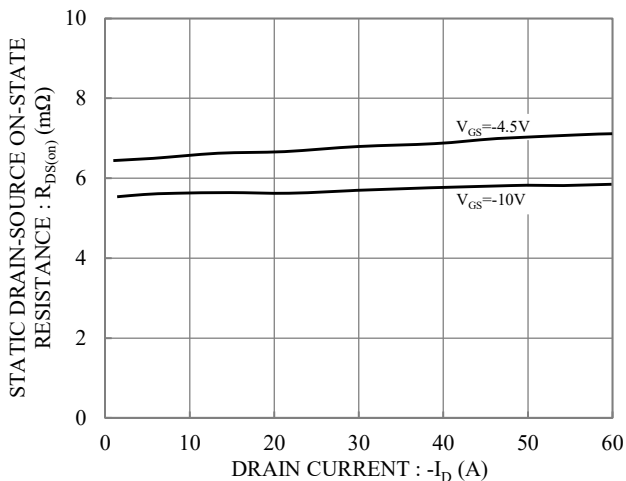


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

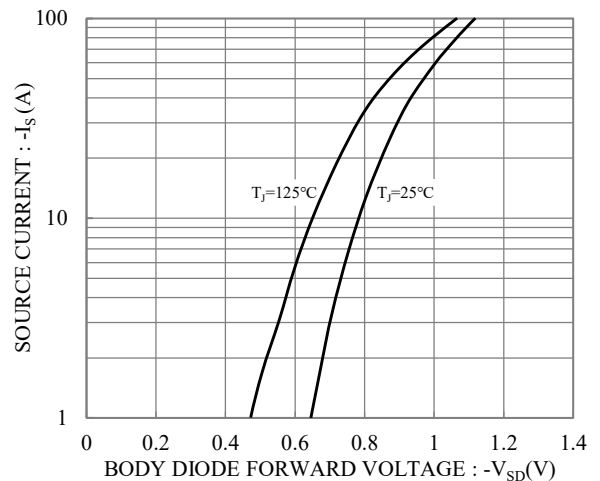


Fig.6 Body Diode Forward Voltage vs. Source Current



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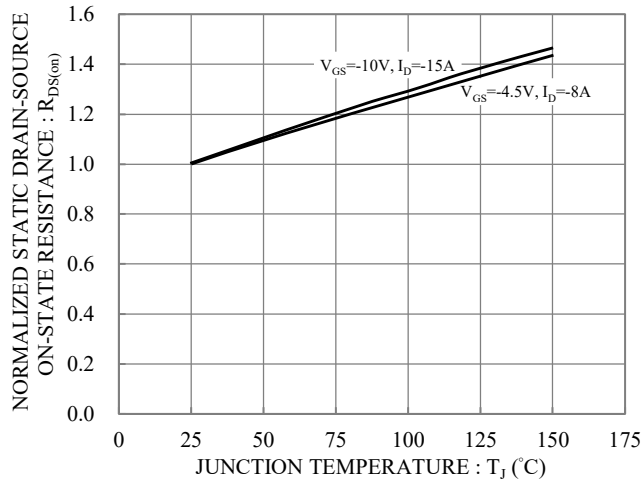


Fig.7 Drain-Source On-State Resistance vs. Junction Temperature

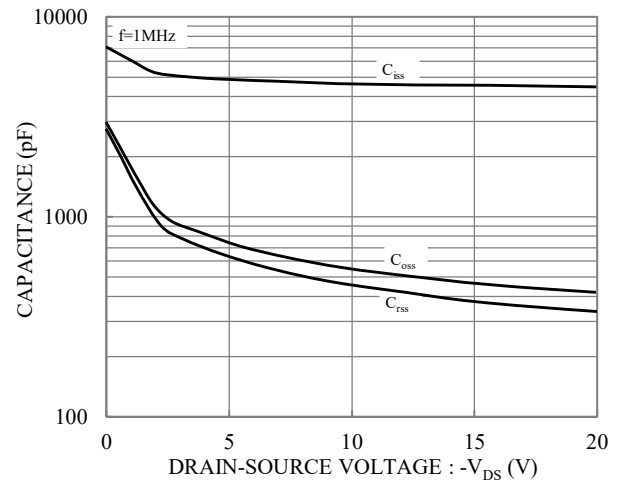


Fig.8 Capacitance vs. Drain-Source Voltage

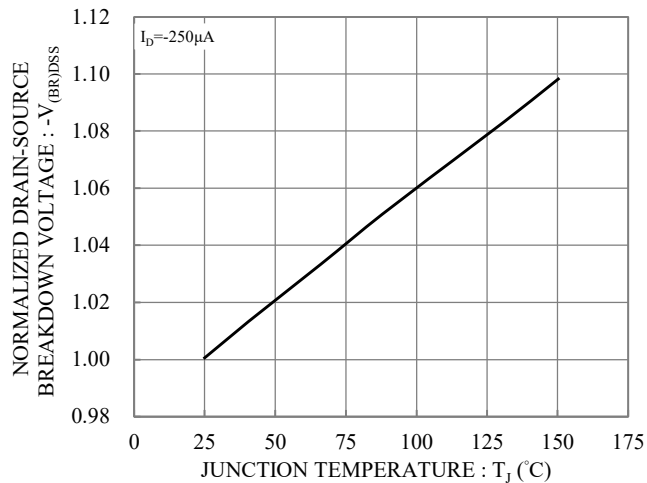


Fig.9 Breakdown Voltage vs. Junction Temperature

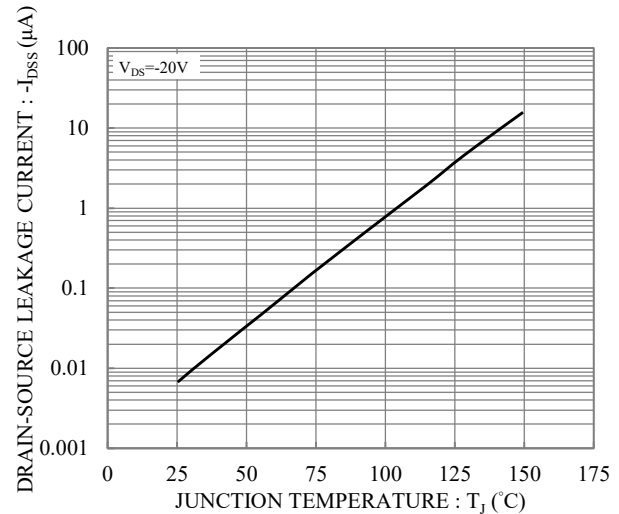


Fig.10 Drain-Source Leakage Current vs. Junction Temperature

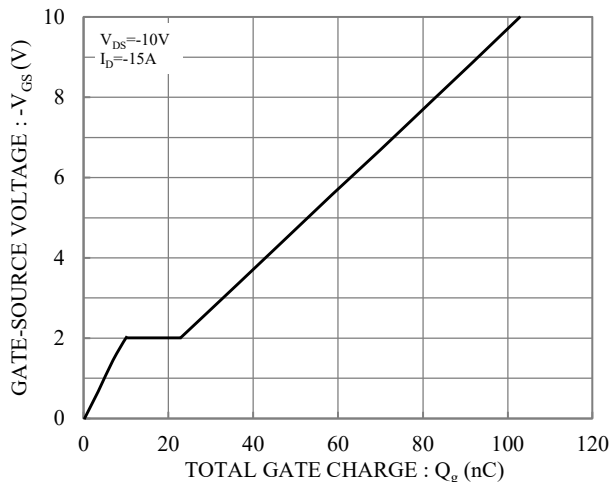


Fig.11 Gate Charge Characteristics

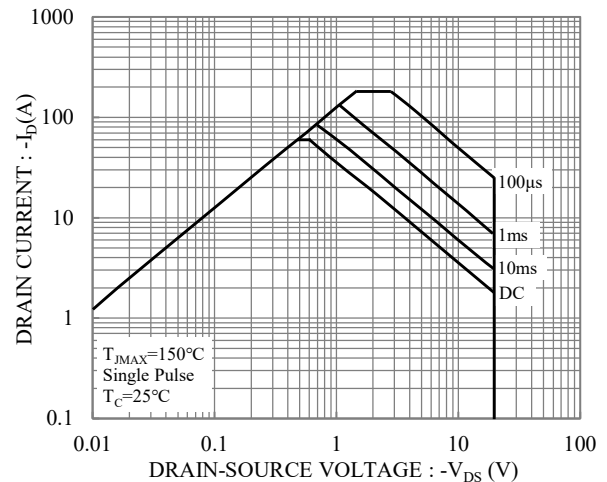


Fig.12 Safe Operation Area



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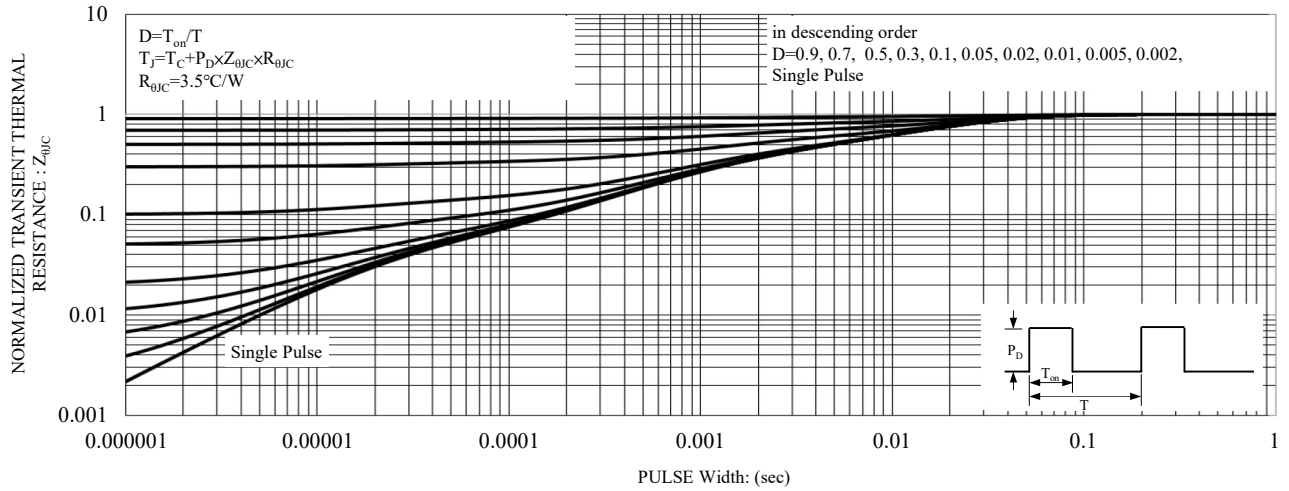


Fig.13 Maximum Transient Thermal Impedance

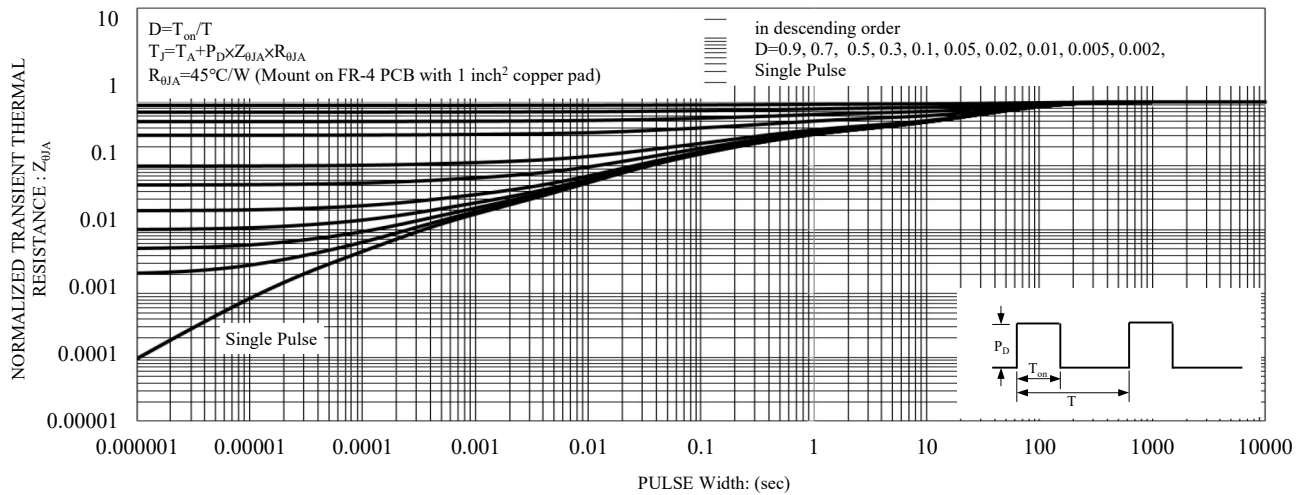


Fig.14 Maximum Transient Thermal Impedance

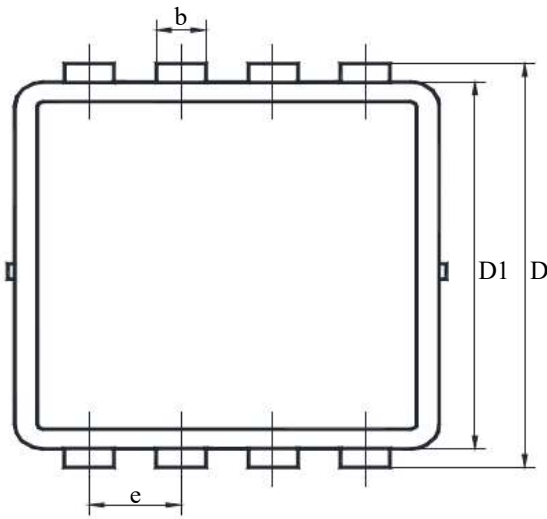


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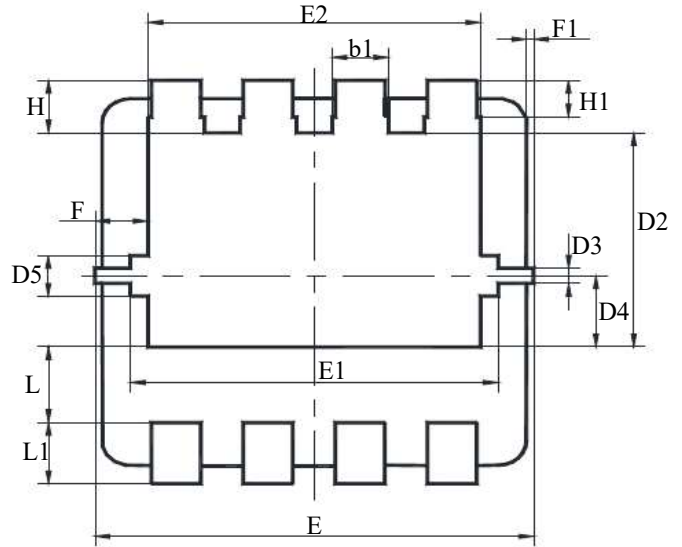
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PACKAGE DIMENSION

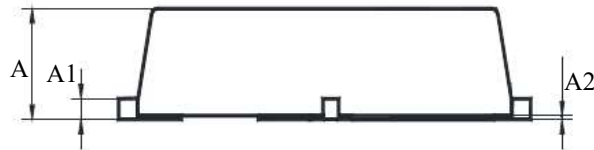
DFN3×3-8L



Top View



Bottom View



Side View

Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.700	0.900	0.028	0.035
A1	0.100	0.250	0.004	0.010
A2	0.000	0.050	0.000	0.002
b	0.240	0.350	0.009	0.014
b1	0.300	0.500	0.012	0.020
D	3.100	3.300	0.122	0.130
D1	2.900	3.100	0.114	0.122
D2	1.650	1.850	0.065	0.073
D3	0.150	0.250	0.006	0.010
D4	0.480	0.680	0.019	0.027
D5	0.230	0.430	0.009	0.017
E	3.000	3.200	0.118	0.126
E1	2.500	2.700	0.098	0.106
E2	2.400	2.600	0.094	0.102
e	0.600	0.700	0.024	0.028
F	0.275	0.475	0.011	0.019
F1	0.000	0.100	0.000	0.004
L	0.520	0.720	0.020	0.028
L1	0.300	0.500	0.012	0.020
H	0.330	0.530	0.013	0.021
H1	0.200	0.400	0.008	0.016



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SUGGESTED SOLDER PAD LAYOUT

