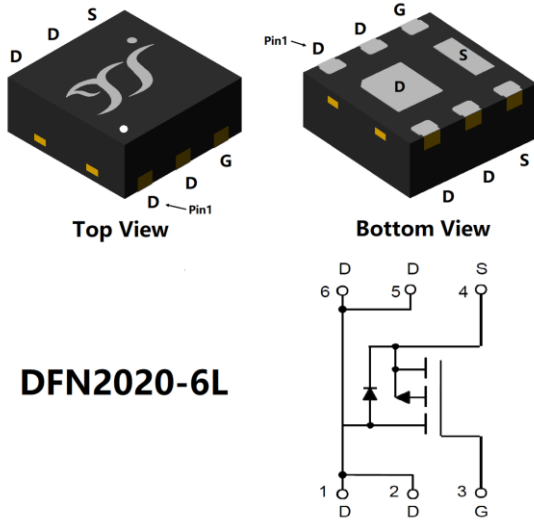




P-Channel Enhancement Mode Field Effect Transistor



DFN2020-6L

Product Summary

• V_{DS}	-60V
• I_D	-7A
• $R_{DS(ON)}$ (at $V_{GS}=-10V$)	$<125m\Omega$
• $R_{DS(ON)}$ (at $V_{GS}=-4.5V$)	$<169m\Omega$

General Description

- High density cell design for low $R_{DS(ON)}$
- High speed switching
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- Reverse polarity protection
- Load switch

Limiting Values

Parameter	Conditions		Symbol	Min	Max	Unit
Drain-source Voltage			V _{DS}	-	-60	V
Gate-source Voltage			V _{GS}	-20	20	
Continuous Drain Current (Note 1,2)	Steady-State	T _A =25°C,V _{GS} =-10V	I _D	-	-2.5	A
		T _A =100°C,V _{GS} =-10V		-	-1.5	
Continuous Drain Current (Note 1,3)	Steady-State	T _C =25°C,V _{GS} =-10V,Chip limitation		-	-7	
		T _C =100°C,V _{GS} =-10V		-	-4.4	
Pulsed Drain Current	T _C =25°C,t _p ≤10μs		I _{DM}	-	-28	
Maximum Body-Diode Continuous Current	T _C =25°C		I _S		-7	
Total Power Dissipation (Note 1,2)	Steady-State	T _A =25°C	P _D	-	1.5	W
		T _A =100°C		-	0.6	
Total Power Dissipation (Note 1,3)	Steady-State	T _C =25°C		-	11.9	
		T _C =100°C		-	4.7	
Junction and Storage Temperature Range			T _J ,T _{STG}	-55	150	°C

Thermal Resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient (Note 2)	Steady-State	$R_{\theta JA}$	-	82	$^{\circ}C/W$
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	-	10.5	



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■ Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A, T_J=25^{\circ}C$	-60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-60V, V_{GS}=0V, T_J=25^{\circ}C$	-	-	-1	μA
		$V_{DS}=-60V, V_{GS}=0V, T_J=150^{\circ}C$	-	-	-100	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V, T_J=25^{\circ}C$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A, T_J=25^{\circ}C$	-1	-1.5	-2	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-2A, T_J=25^{\circ}C$	-	96	125	m Ω
		$V_{GS}=-4.5V, I_D=-1A, T_J=25^{\circ}C$	-	113	169	m Ω
Diode Forward Voltage	V_{SD}	$I_S=-2A, V_{GS}=0V, T_J=25^{\circ}C$	-	-0.82	-1.2	V
Gate Resistance	R_G	$f=1MHz, T_J=25^{\circ}C$	-	9.5	-	Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=-30V, V_{GS}=0V, f=1MHz, T_J=25^{\circ}C$	-	703	-	μF
Output Capacitance	C_{oss}		-	38	-	
Reverse Transfer Capacitance	C_{rss}		-	32	-	
Switching Parameters						
Total Gate Charge	Q_g	$V_{GS}=-10V, V_{DS}=-30V, I_D=-2A, T_J=25^{\circ}C$	-	16.2	-	nC
Gate-Source Charge	Q_{gs}		-	1.4	-	
Gate-Drain Charge	Q_{gd}		-	2.4	-	
Reverse Recovery Charge	Q_{rr}	$I_F=-2A, di/dt=100A/\mu s, V_{GS}=0V, V_R=-30V, T_J=25^{\circ}C$	-	21	-	nC
Reverse Recovery Time	t_{rr}		-	19.7	-	ns
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=-10V, V_{DS}=-30V, I_D=-2A, R_{GEN}=3\Omega, T_J=25^{\circ}C$	-	6.8	-	ns
Turn-on Rise Time	t_r		-	2.9	-	
Turn-off Delay Time	$t_{D(off)}$		-	26.8	-	
Turn-off Fall Time	t_f		-	5.1	-	

Note:

1. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
2. The value of $R_{\theta JA}$ is measured with the device mounted on the 40mm*40mm*1.1mm single layer FR-4 PCB board with 1 in² pad of 2oz. Copper, in the still air environment with $T_A=25^\circ C$. The maximum allowed junction temperature of $150^\circ C$. The value in any given application depends on the user's specific board design.
3. Thermal resistance from junction to soldering point (on the exposed drain pad).



■ Typical Electrical and Thermal Characteristics Diagrams

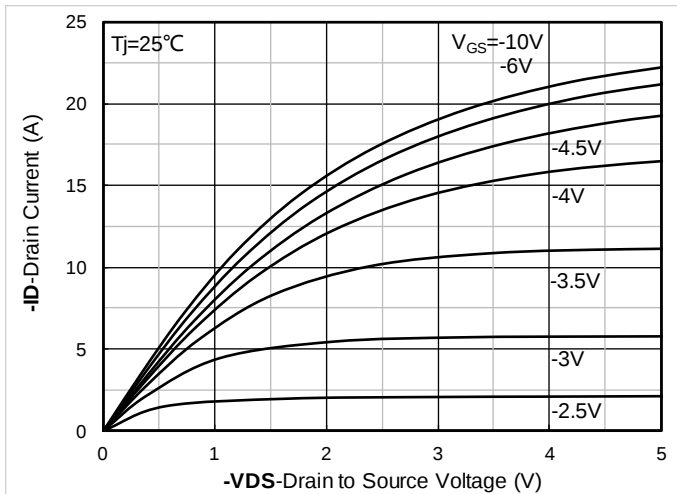


Figure 1. Output Characteristics; typical values

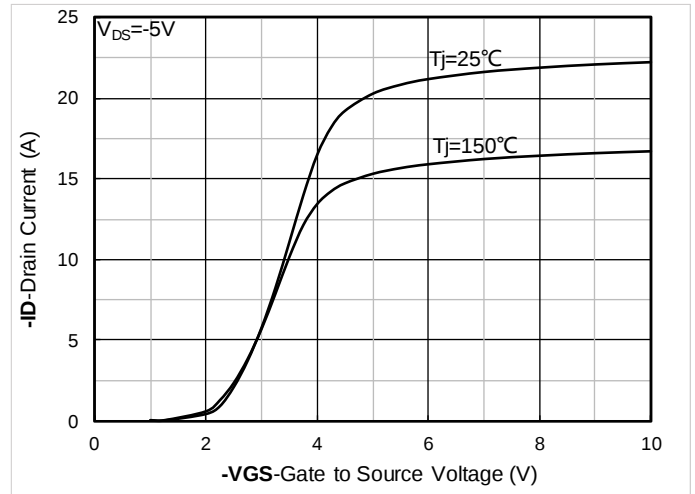


Figure 2. Transfer Characteristics; typical values

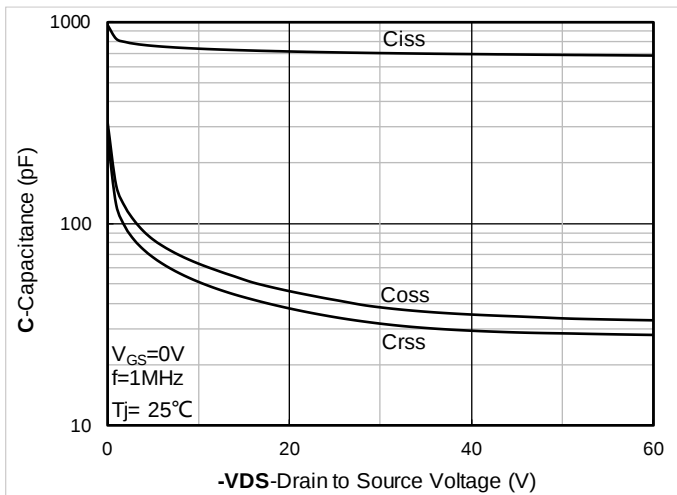


Figure 3. Capacitance Characteristics; typical values

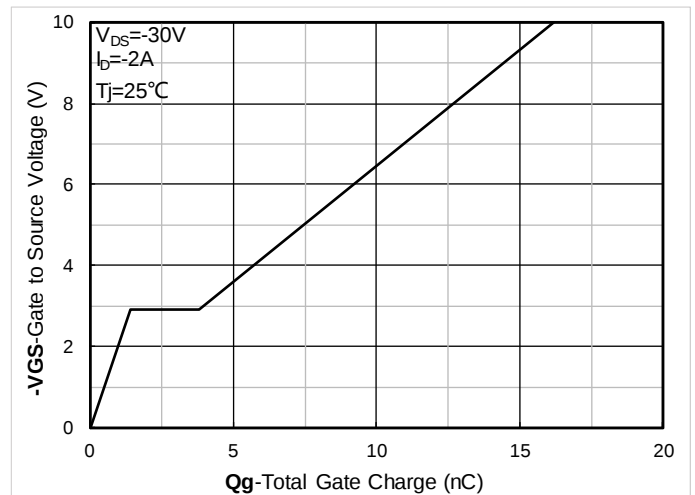


Figure 4. Gate Charge; typical values

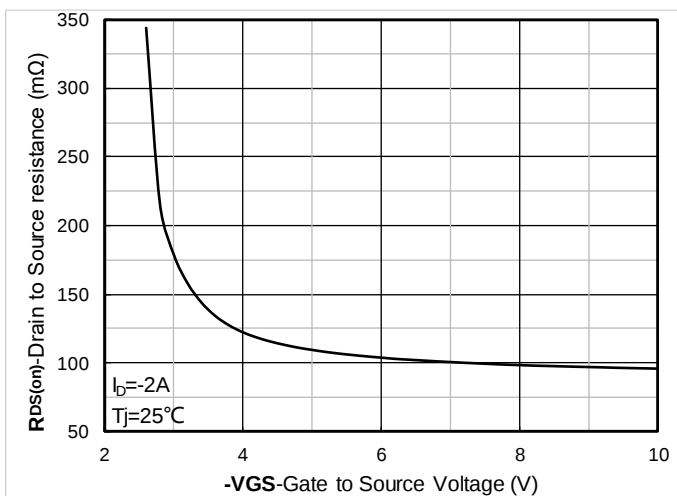


Figure 5. On-Resistance vs Gate to Source Voltage; typical values

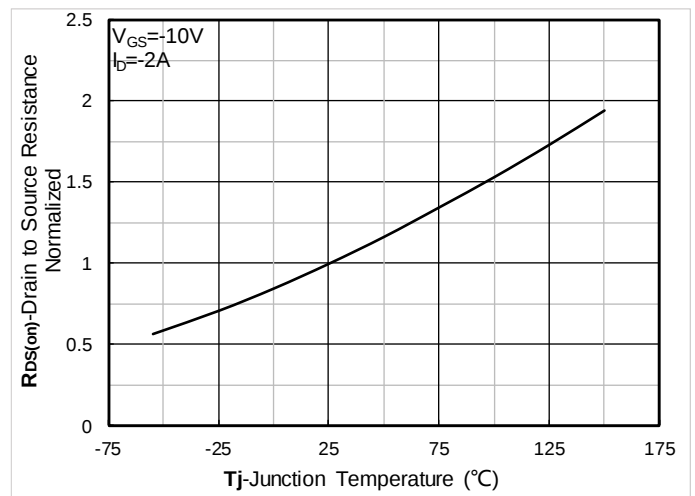


Figure 6. Normalized On-Resistance

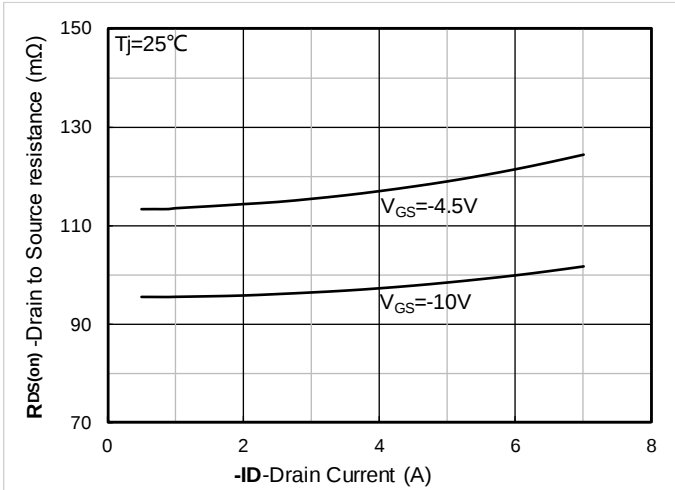


Figure 7. $R_{DS(on)}$ VS Drain Current; typical values

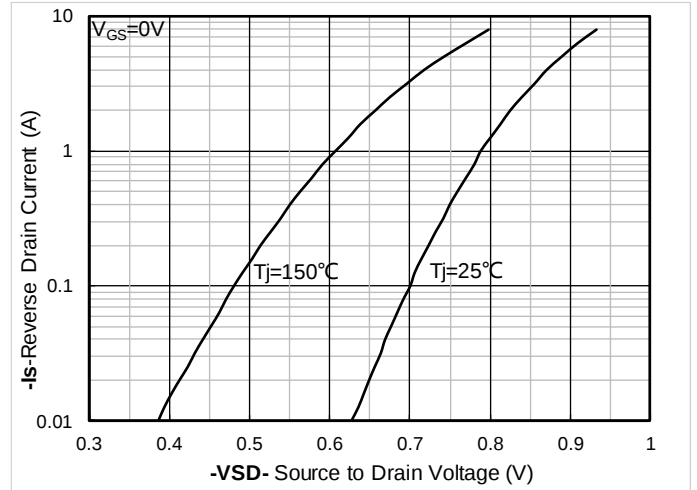


Figure 8. Forward characteristics of reverse diode; typical values

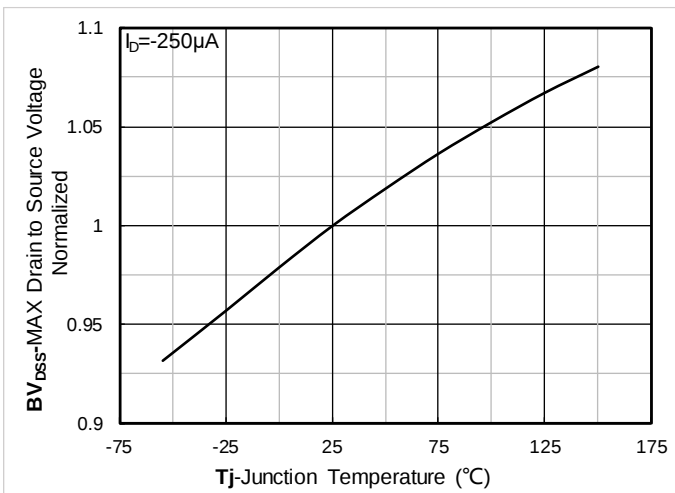


Figure 9. Normalized breakdown voltage

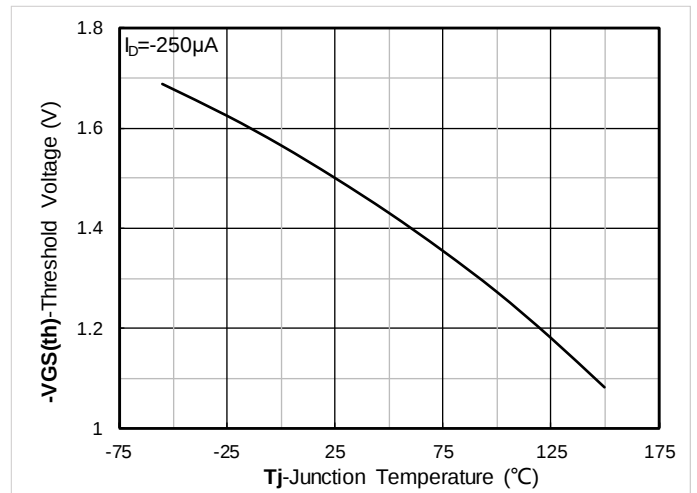


Figure 10. Gate Threshold voltage; typical values

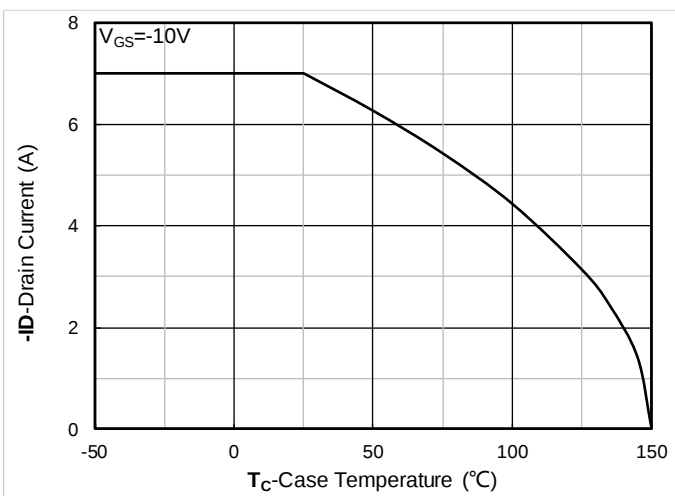


Figure 11. Current dissipation

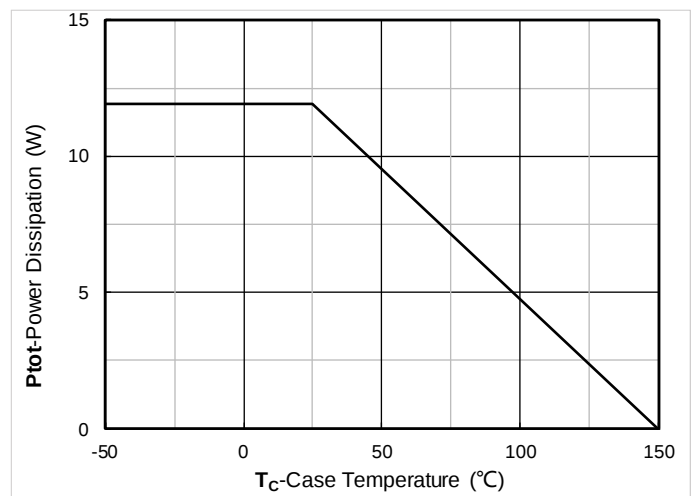


Figure 12. Power dissipation

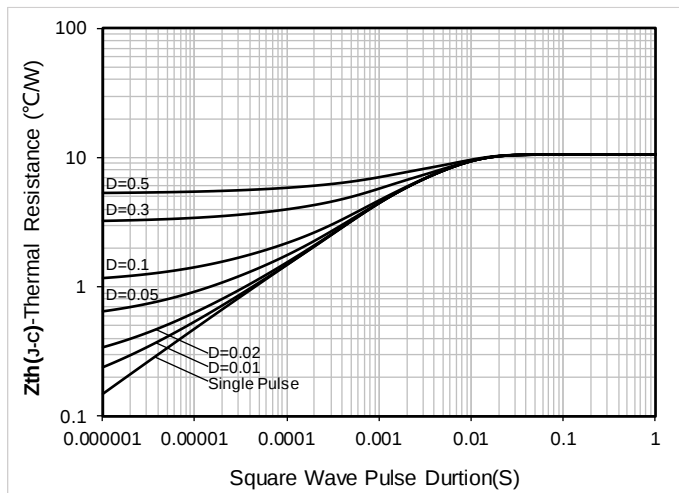


Figure 13. Maximum Transient Thermal Impedance

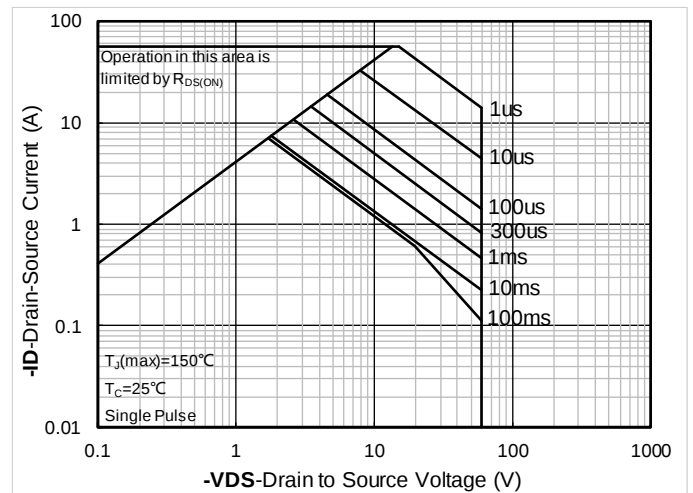
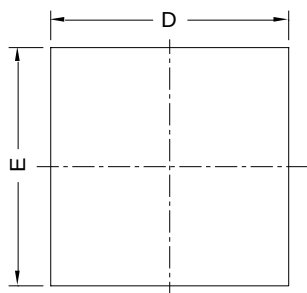


Figure 14. Safe Operation Area

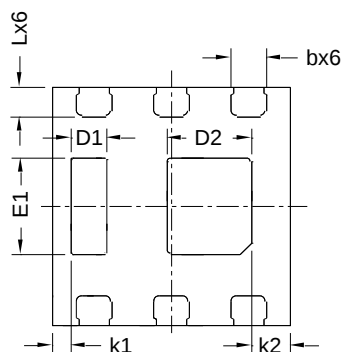


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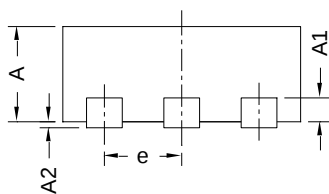
■ DFN2020-6L-E-0.80MM Package information



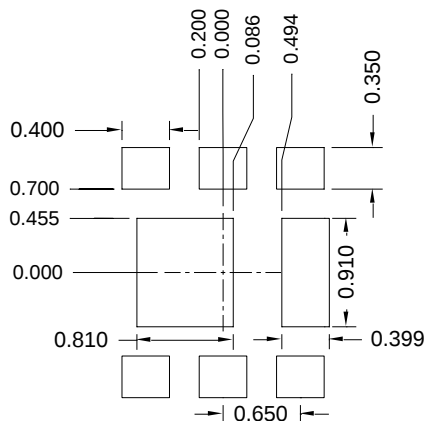
Top View
正面视图



Bottom View
背面视图



Side View
侧面视图



Suggested Solder Pad Layout
Top View

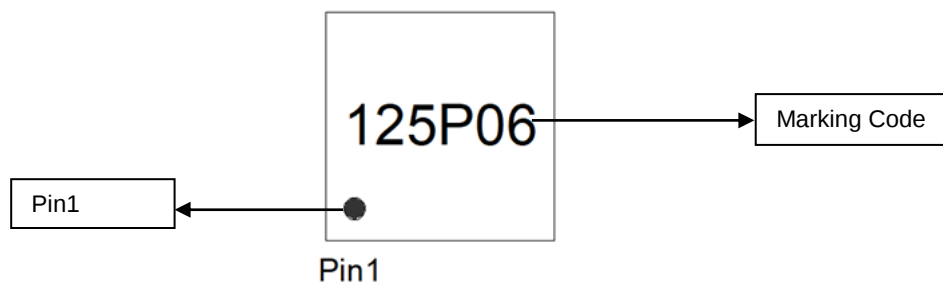
SYMBOL	MILLIMETER		
	MIN	NOM	MAX
D	1.90	2.00	2.10
E	1.90	2.00	2.10
A	0.70	0.80	0.90
A1	0.20 BSC		
A2			0.10
D1	0.20	0.30	0.40
D2	0.61	0.71	0.81
E1	0.71	0.81	0.91
L	0.15	0.25	0.35
b	0.20	0.30	0.40
e	0.65 BSC		
k1	0.156 BSC		
k2	0.326 BSC		

Note:

- 1.Controlling dimension:in millimeters.
- 2.General tolerance:±0.10mm.
- 3.The pad layout is for reference purposes only.



■ Marking Information



- Note:
1. All marking is at middle of the product body
 2. All marking is in laser printing
 3. 125P06 is marking code
 4. Body color: Black



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