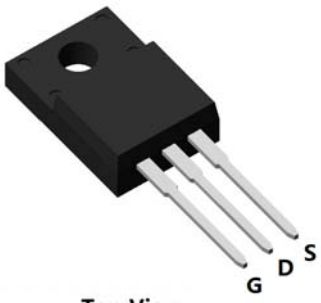
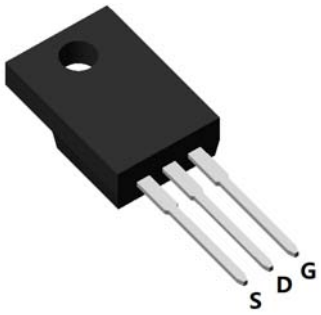
N-Channel Enhancement Mode Field Effect Transistor

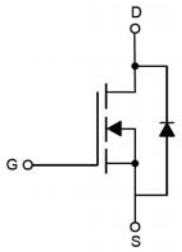


Top View



Bottom View

ITO-220AB



Product Summary

- V_{DS} 650V
- I_D 6.5A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜580mΩ
- 100% EAS Tested
- 100% ▽V_{DS} Tested

General Description

- Super Junction High Voltage MOSFET technology
- Ultra Low Gate Charge Cause Lower Driving Requirement
- Low On-resistance and Low Conduction Loss
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- PC power、Telecom power and Server power
- LED lighting
- EV Charger
- Solar/UPS

■ Limiting Values

Parameter	Conditions		Symbol	Min	Max	Unit
Drain-source Voltage			V_{DS}	-	650	V
Gate-source Voltage			V_{GS}	-30	30	
Continuous Drain Current (Note 1,2)	Steady-State	T_A=25℃,V_{GS}=10V	I_D	-	1.09	A
		T_A=100℃,V_{GS}=10V		-	0.69	
Continuous Drain Current (Note 1,3)	Steady-State	T_C=25℃,V_{GS}=10V		-	6.5	
		T_C =100℃,V_{GS}=10V		-	4.1	
Pulsed Drain Current	T_C=25℃,t_p≤10μs		I_{DM}	-	16	
Maximum Body-Diode Continuous Current	T_C=25℃		I_S		6.5	
Maximum Body-Diode Pulsed Current	T_C=25℃,t_p≤10μs		I_{SM}	-	16	
Avalanche Energy (non-repetitive)	T_J=25℃,V_G=10V,R_G=25Ω,L=30mH,I_{AS}=2.8A		EAS	-	117.6	mJ
Total Power Dissipation (Note 1,2)	Steady-State	T_A=25℃	P_D	-	1.86	W
		T_A=100℃		-	0.74	
Total Power Dissipation (Note 1,3)	Steady-State	T_C=25℃		-	40.8	
		T_C =100℃		-	16.3	
MOSFET dv/dt Ruggedness	T_J=25℃,V_{DS}=0…400V,ID<=4A,Rg=0Ω		dv/dt	-	70	V/ns
Reverse Diode dv/dt	T_J=25℃,V_{DS}=0…400V,ID<=4A,di/dt=100A/us		dv/dt	-	87	
Maximum Diode Commutation Speed	T_J=25℃,V_{DS}=0…400V,ID<=4A,Rg=0Ω		dif/dt	-	2200	A/us
Junction and Storage Temperature Range			T_J ,T_{STG}	-55	150	℃

■Thermal Resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient (Note 2)	Steady-State	$R_{\theta JA}$	-	67	℃/W
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	-	3.06	

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
F580D65CH	B1	F580D65CH	50	/	5000	Tube

■ Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA,Tj=25℃	650	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=650V,V_{GS}=0V,Tj=25℃	-	-	1	μA
		V_{DS}=650V,V_{GS}=0V,Tj=150℃	-	-	100	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±30V,V_{DS}=0V,Tj=25℃	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA,Tj=25℃	2.6	3.4	4.2	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=4A,Tj=25℃	-	500	580	mΩ
		V_{GS}=10V,I_D=4A,Tj=150℃	-	1335	1550	
Diode Forward Voltage	V_{SD}	I_S=4A,V_{GS}=0V,Tj=25℃	-	0.84	1.2	V
Gate Resistance	R_G	f=1MHz,Tj=25℃	-	5.5	-	Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=400V,V_{GS}=0V,f=1MHz,Tj=25℃	-	400	-	pF
Output Capacitance	C_{oss}		-	12.9	-	
Reverse Transfer Capacitance	C_{rss}		-	1.9	-	
Effective Output capacitance, Energy Related	$C_{o(er)}$	V_{DS}=0…400V,V_{GS}=0V,f=1MHz, Tj=25℃	-	20	-	
Effective Output Capacitance, Time Related	$C_{o(tr)}$		-	113	-	
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=400V,I_D=4A,Tj=25℃	-	13.2	-	nC
Gate-Source Charge	Q_{gs}		-	2.3	-	
Gate-Drain Charge	Q_{gd}		-	7.1	-	
Reverse Recovery Charge	Q_{rr}	I_F=4A,di/dt=100A/μs,V_{GS}=0V, V_R=400V,Tj=25℃	-	1440	-	nC
Reverse Recovery Time	t_{rr}		-	171	-	ns
Peak Reverse Recovery Current	I_{rrm}		-	17.2	-	A
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=13V,V_{DS}=400V,I_D=4A, R_{GEN}=3Ω,Tj=25℃	-	20	-	ns
Turn-on Rise Time	t_r		-	20	-	
Turn-off Delay Time	$t_{D(off)}$		-	22.5	-	
Turn-off Fall Time	t_f		-	48	-	

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 in the still air environment with T_A =25℃.The maximum allowed junction temperature of 150℃.
3. Thermal resistance from junction to soldering point (on the exposed drain pad).

■Typical Electrical and Thermal Characteristics Diagrams

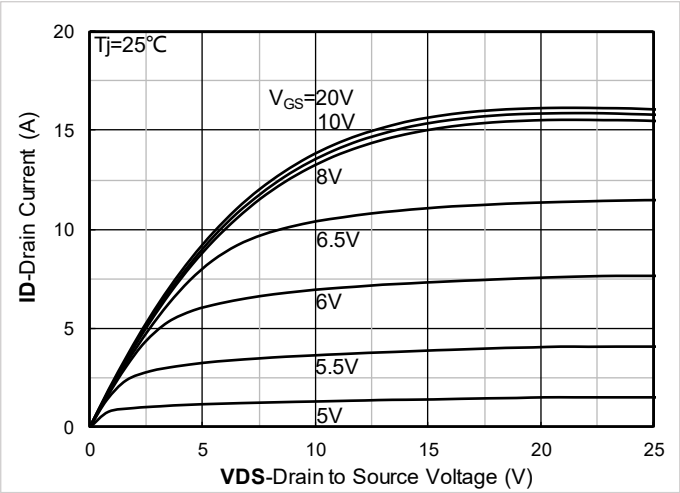


Figure 1. Output Characteristics; typical values

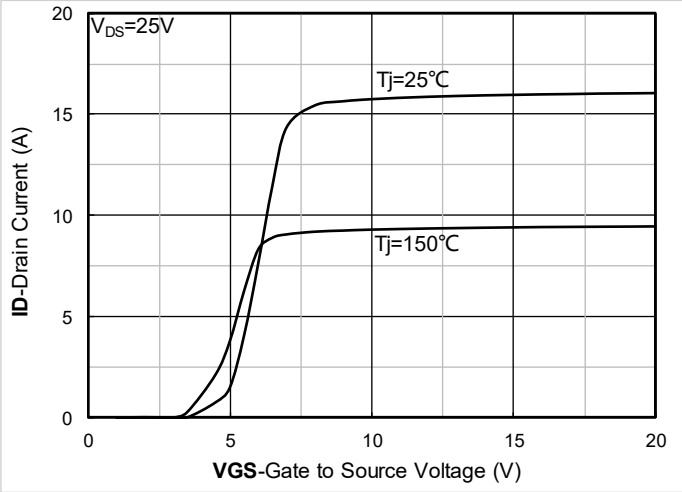


Figure 2. Transfer Characteristics; typical values

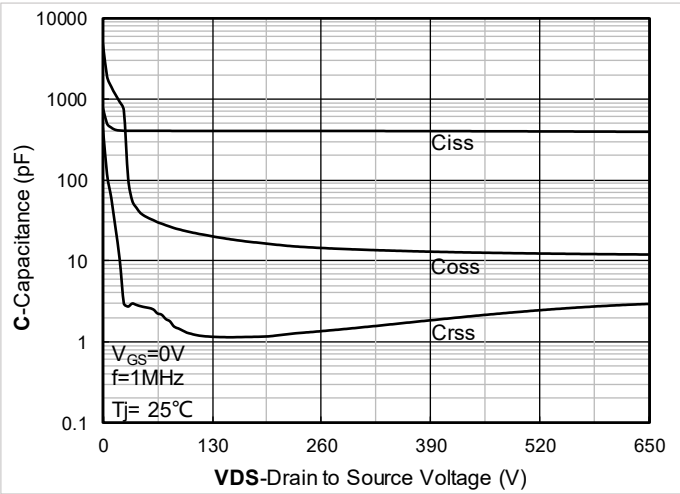


Figure 3. Capacitance Characteristics; typical values

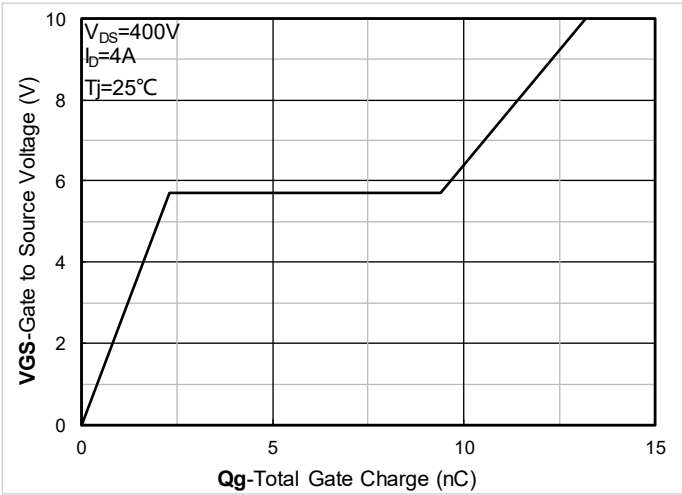


Figure 4. Gate Charge; typical values

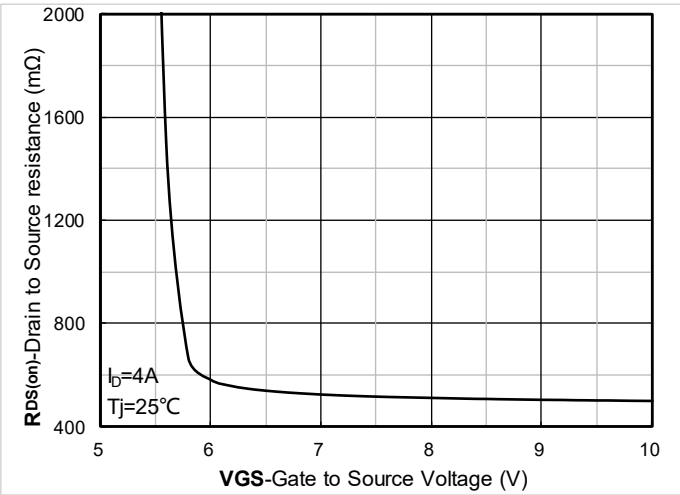


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

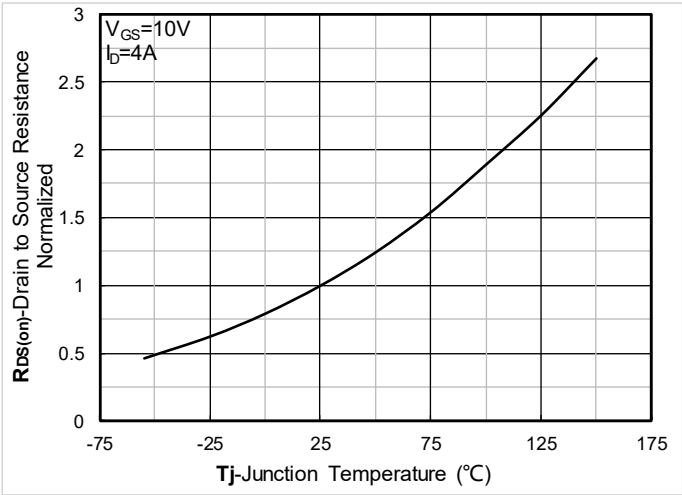


Figure 6. Normalized On-Resistance

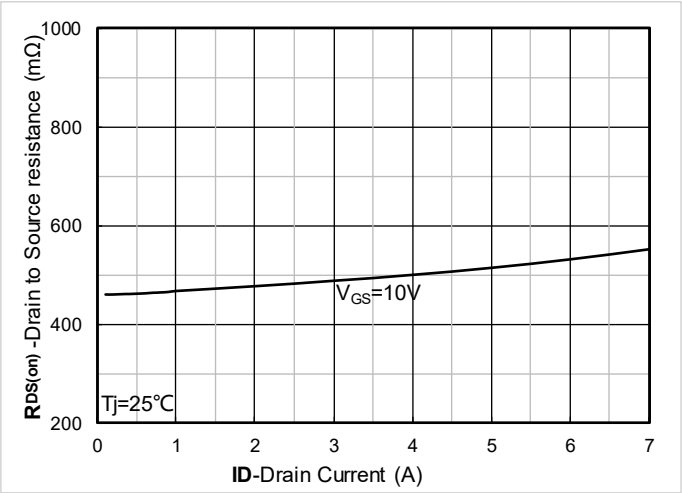


Figure 7. $R_{DS(on)}$ vs. Drain Current; typical values

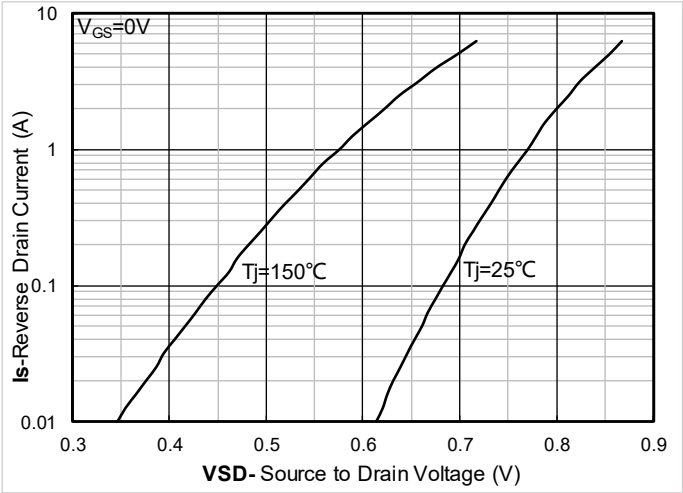


Figure 8. Forward characteristics of reverse diode; typical values

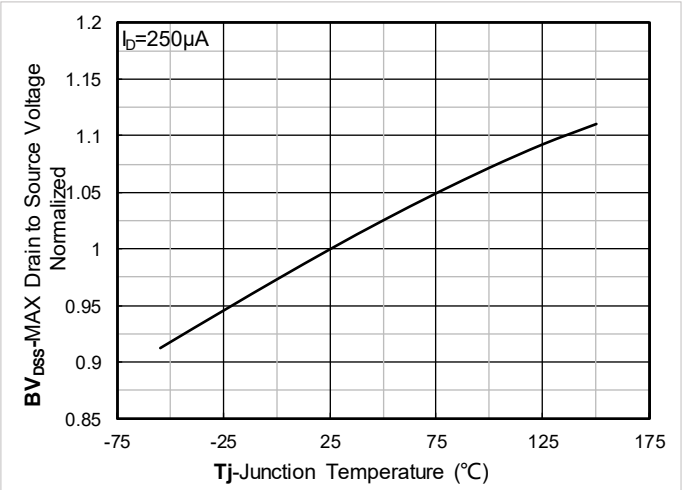


Figure 9. Normalized breakdown voltage

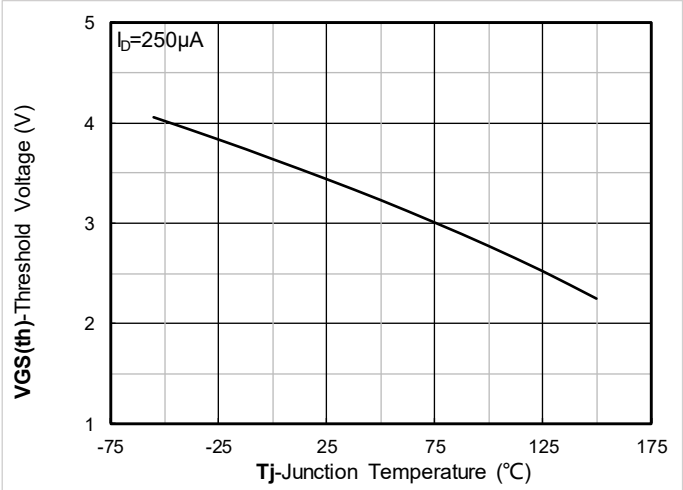


Figure 10. Gate Threshold voltage; typical values

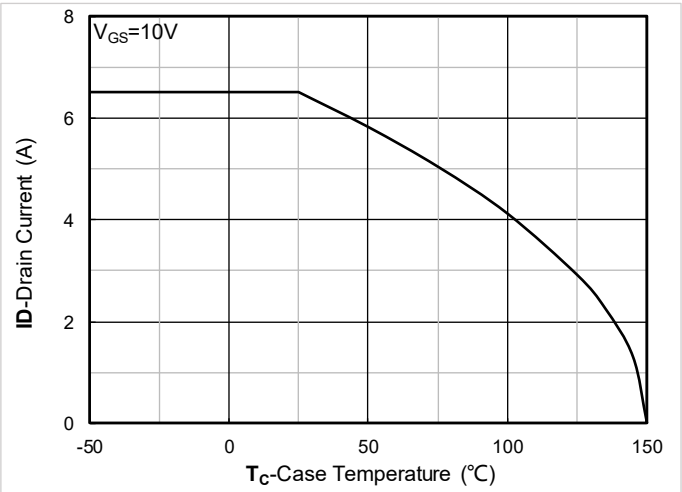


Figure 11. Current dissipation

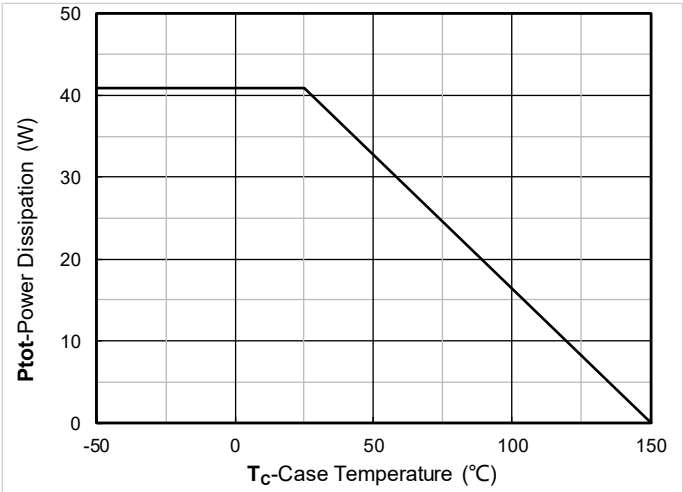


Figure 12. Power dissipation

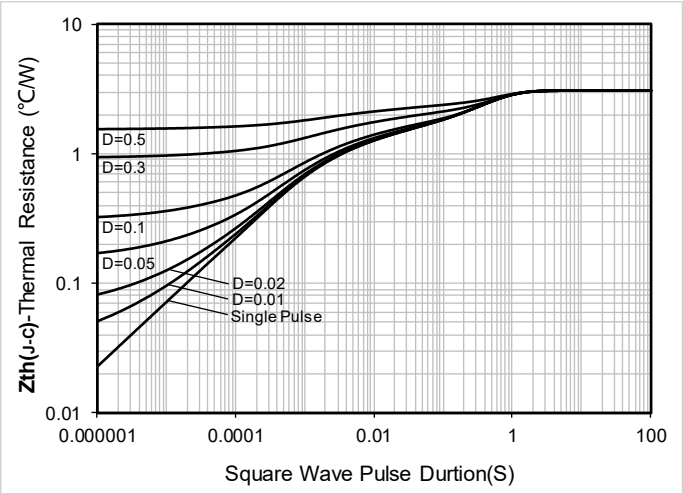


Figure 13. Maximum Transient Thermal Impedance

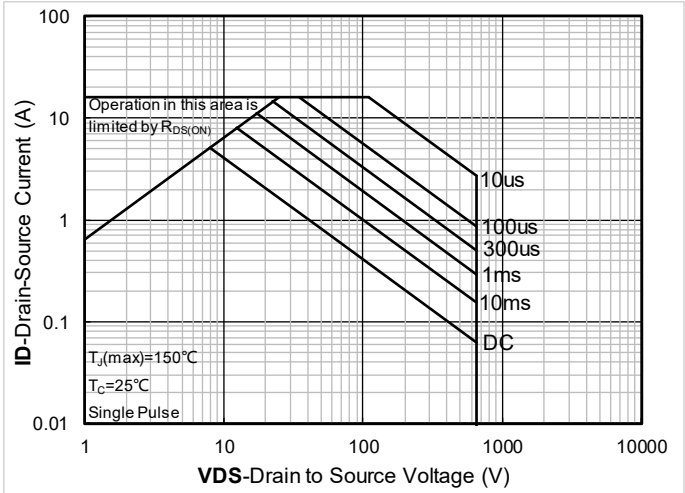
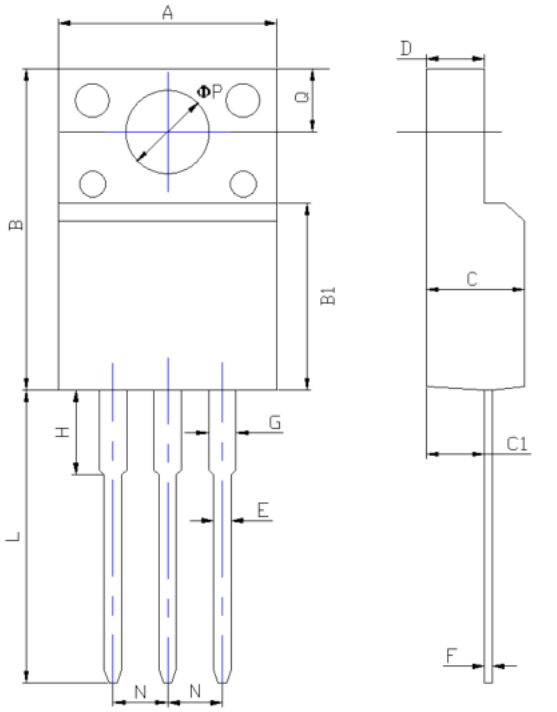


Figure 14. Safe Operation Area

■ ITO-220AB-E Package information



TOP VIEW SIDE VIEW

DIMENSIONS				
SYMBOL	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.390	0.406	9.900	10.300
B	0.610	0.633	15.500	16.100
B1	0.350	0.374	8.900	9.500
C	0.181	0.189	4.600	4.800
C1	0.087	0.110	2.200	2.800
D	0.096	0.104	2.450	2.650
E	0.028	0.035	0.700	0.900
F	0.016	0.024	0.400	0.600
G	0.044	0.056	1.120	1.420
H	0.134	0.150	3.400	3.800
L	0.496	0.512	12.600	13.000
N	0.100BSC.		2.540BSC.	
Q	0.126	0.142	3.200	3.600
ΦP	0.122	0.130	3.100	3.300

NOTE:
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.

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