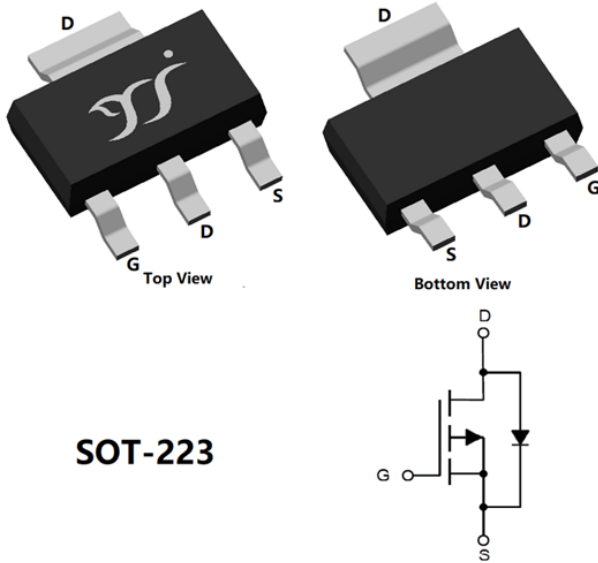


P-Channel Enhancement Mode Field Effect Transistor



Product Summary

• V_{DS}	-40V
• I_D	-5.6A
• $R_{DS(ON)}$ (at $V_{GS}=-10V$)	<34m Ω
• $R_{DS(ON)}$ (at $V_{GS}=-4.5V$)	<52m Ω

General Description

- Low $R_{DS(on)}$ & FOM
- Extremely low switching loss
- Excellent stability and uniformity
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- Power management
- Portable equipment

Limiting Values

Parameter	Conditions		Symbol	Min	Max	Unit
Drain-Source Voltage			V _{DS}	-	-40	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	-	-5.6	A
		T _A =100°C,V _{GS} =-10V		-	-3.5	
Pulsed Drain Current	T _A =25°C,t _p ≤10μs		I _{DM}	-	-22.4	
Maximum Body-Diode Continuous Current	T _A =25°C		I _S	-	-1.5	
Total Power Dissipation (Note 1,2)	Steady-State	T _A =25°C	P _D	-	1.81	W
		T _A =100°C		-	0.72	
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	$R_{\theta JA}$	-	69	$^{\circ}C/W$



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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 =-250μA, T _j =25°C	-40	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-40V, V _{GS} =0V, T _j =25°C	-	-	-1	μA
		V _{DS} =-40V, V _{GS} =0V, T _j =125°C	-	-	-100	
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V, T _j =25°C	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA, T _j =25°C	-1.1	-1.6	-2.1	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-5A, T _j =25°C	-	26	34	mΩ
		V _{GS} =-4.5V, I _D =-2.5A, T _j =25°C	-	35	52	mΩ
Diode Forward Voltage	V _{SD}	I _S =-5A, V _{GS} =0V, T _j =25°C	-	-0.86	-1.2	V
Gate Resistance	R _G	f=1MHz, T _j =25°C	-	18	-	Ω
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =-20V, V _{GS} =0V, f=1MHz, T _j =25°C	-	1077	-	pF
Output Capacitance	C _{oss}		-	118	-	
Reverse Transfer Capacitance	C _{rss}		-	103	-	
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =-10V, V _{DS} =-20V, I _D =-5A, T _j =25°C	-	25.3	-	nC
Gate-Source Charge	Q _{gs}		-	3.8	-	
Gate-Drain Charge	Q _{gd}		-	3.6	-	
Reverse Recovery Charge	Q _{rr}	I _F =-5A, di/dt=100A/μs, V _{GS} =0V, V _R =-20V, T _j =25°C	-	17	-	nC
Reverse Recovery Time	t _{rr}		-	19.5	-	ns
Turn-on Delay Time	t _{D(on)}	V _{GS} =-10V, V _{DS} =-20V, I _D =-5A, R _{GEN} =3Ω, T _j =25°C	-	6.4	-	ns
Turn-on Rise Time	t _r		-	3.1	-	
Turn-off Delay Time	t _{D(off)}		-	90.5	-	
Turn-off Fall Time	t _f		-	52.9	-	

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.

■ Typical Electrical and Thermal Characteristics Diagrams

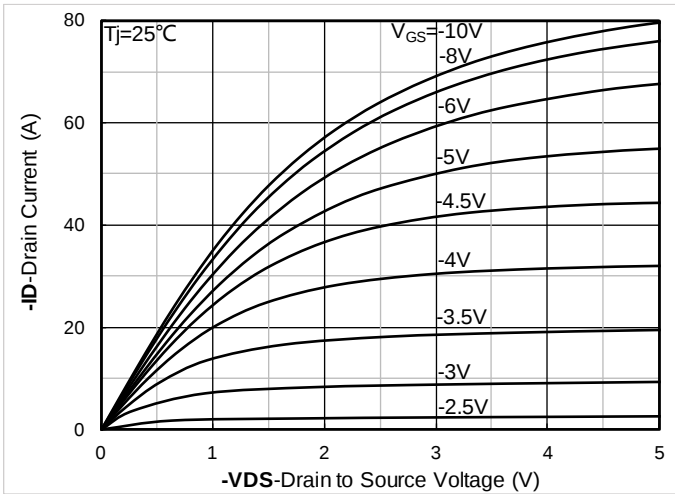


Figure 1. Output Characteristics; typical values

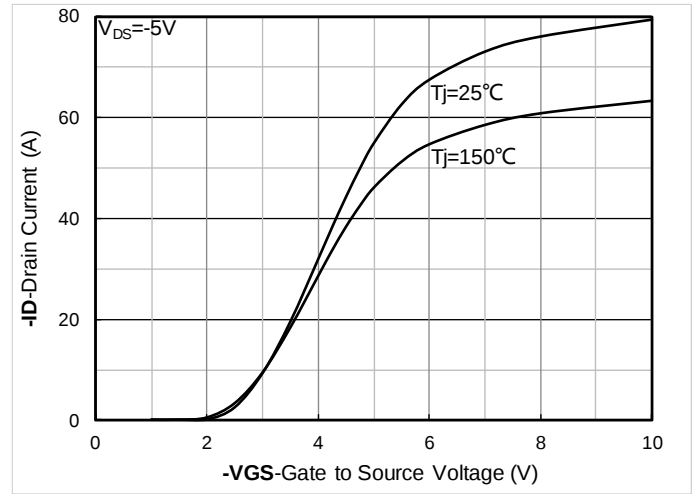


Figure 2. Transfer Characteristics; typical values

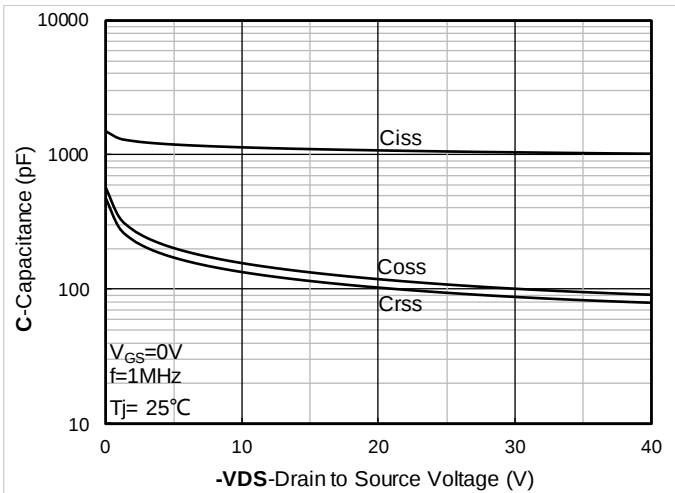


Figure 3. Capacitance Characteristics; typical values

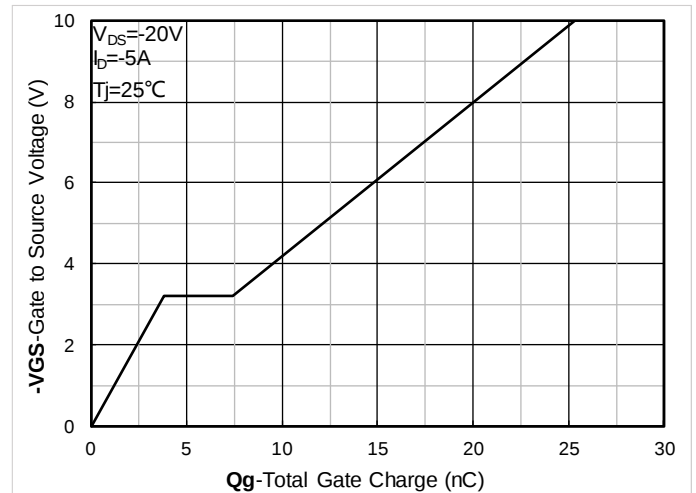


Figure 4. Gate Charge; typical values

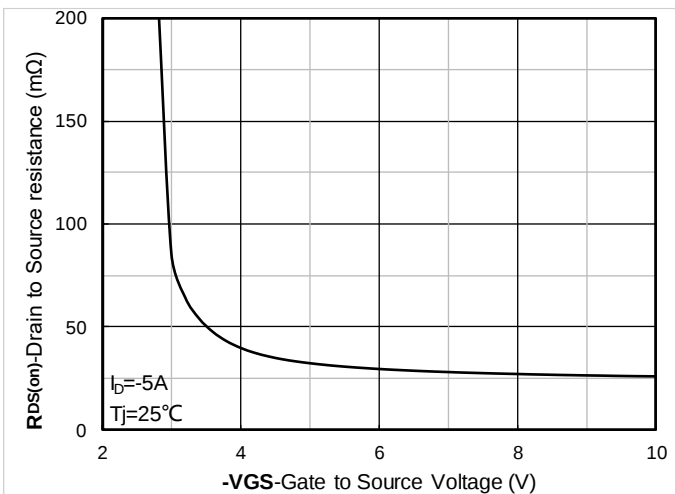


Figure 5. On-Resistance vs Gate to Source Voltage; typical values

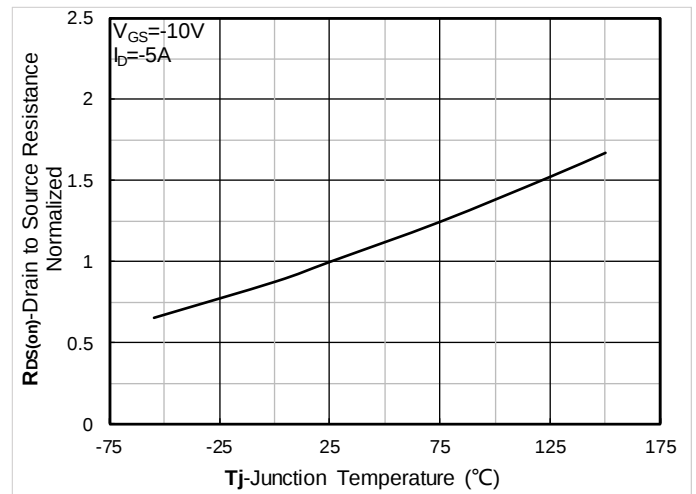


Figure 6. Normalized On-Resistance

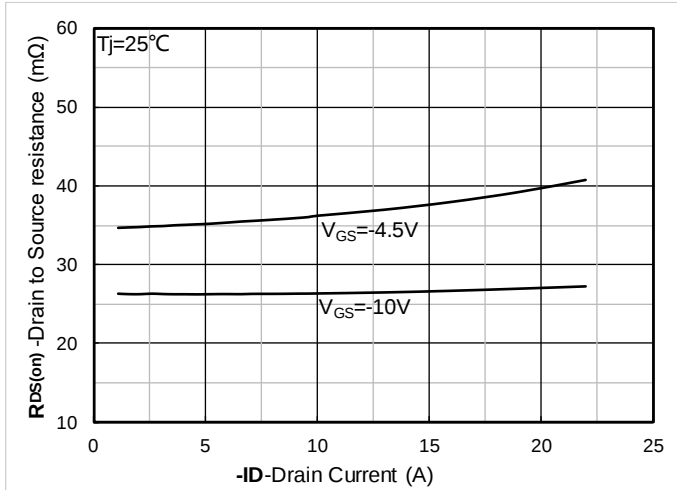


Figure 7. $R_{DS(on)}$ VS Drain Current; typical values

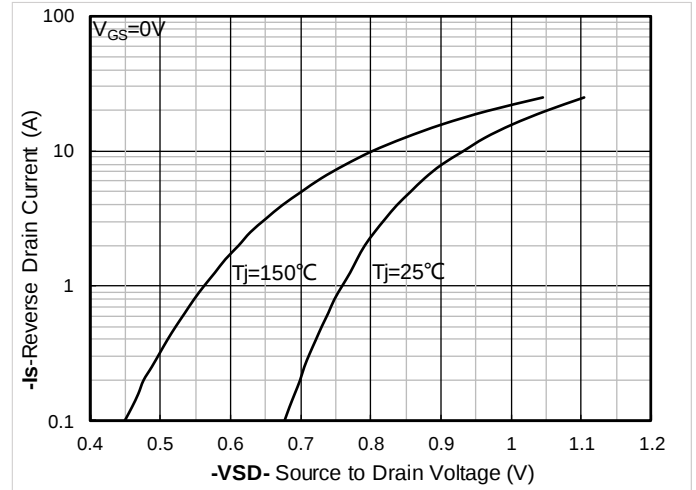


Figure 8. Forward characteristics of reverse diode; typical values

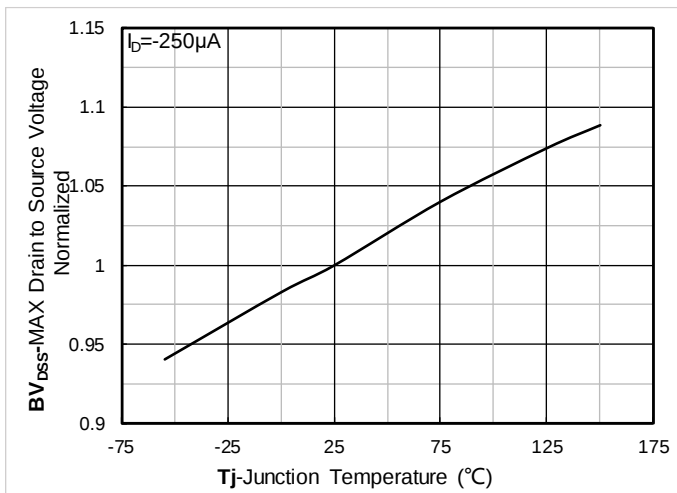


Figure 9. Normalized breakdown voltage

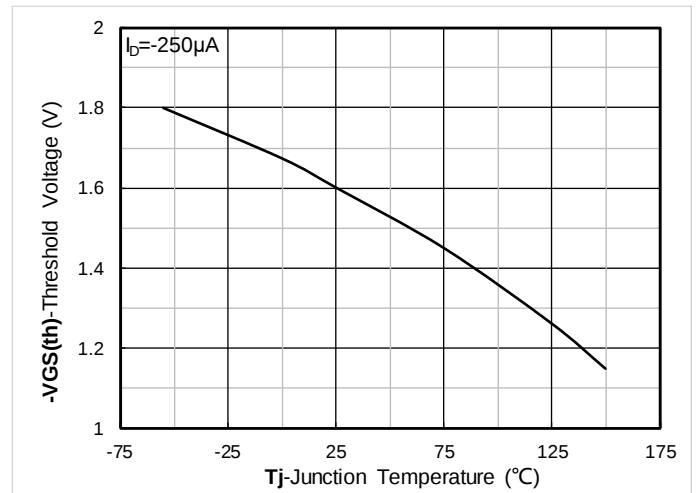


Figure 10. Gate Threshold voltage; typical values

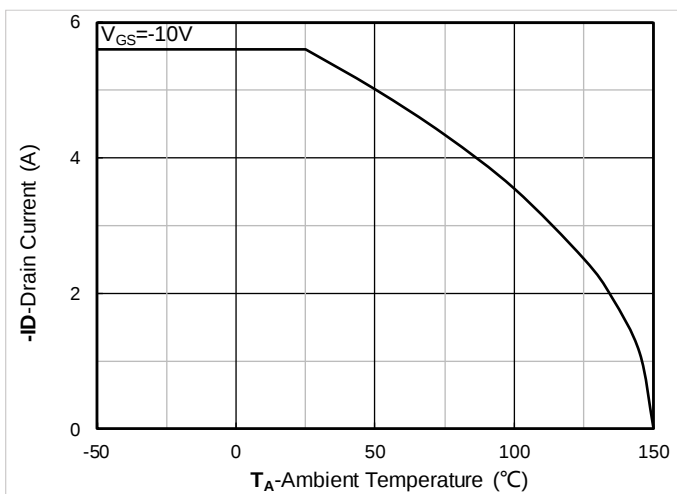


Figure 11. Current dissipation

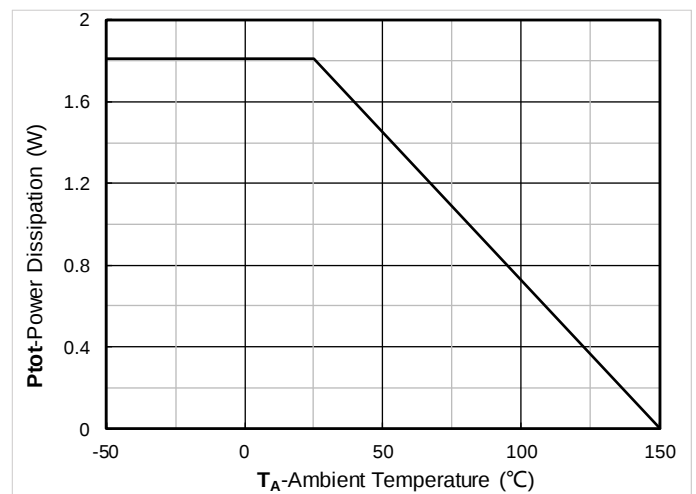


Figure 12. Power dissipation

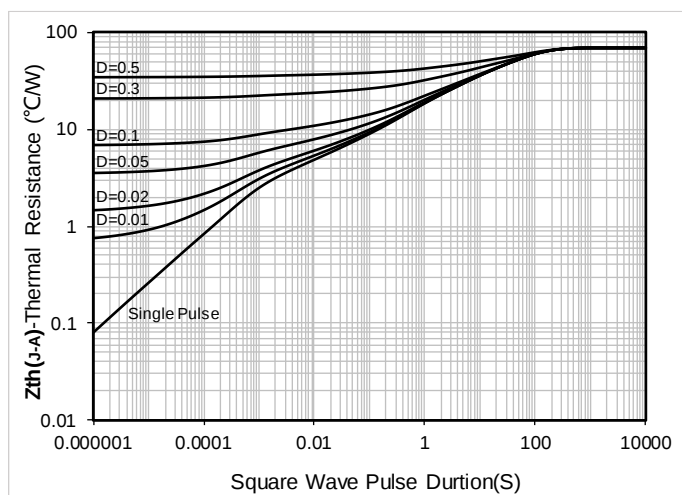


Figure 13. Maximum Transient Thermal Impedance

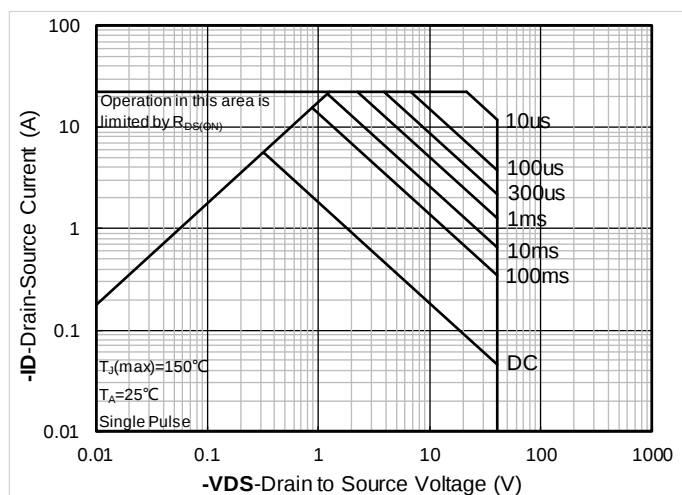
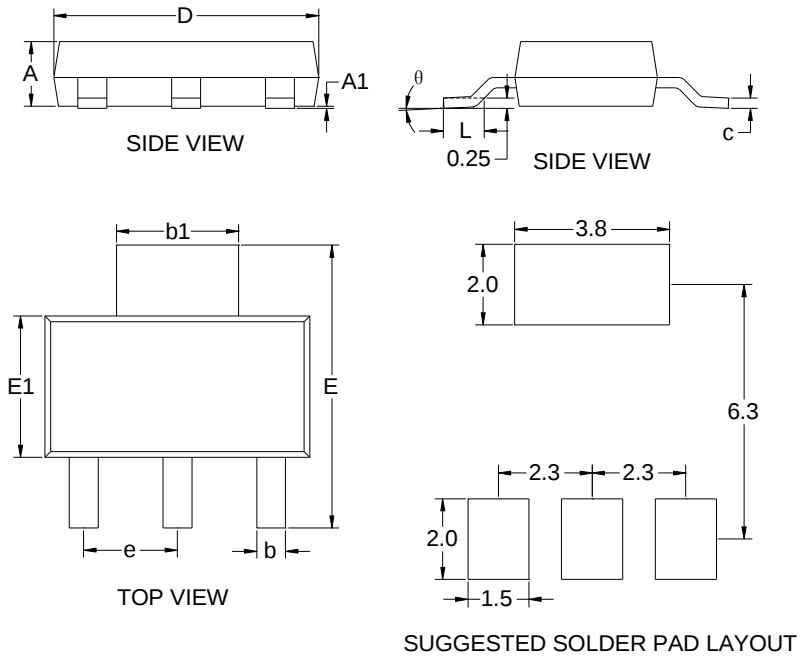


Figure 14. Safe Operation Area



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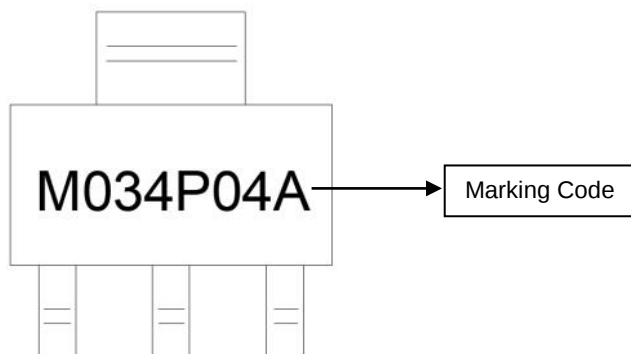
■ SOT-223 Package information



DIM	DIMENSIONS			
	INCHES		MM	
	MIN	MAX	MM	MAX
A	0.0591	0.0670	1.5000	1.7000
A1	0.0008	0.0039	0.0200	0.1000
b	0.0259	0.0330	0.6600	0.8400
b1	0.1140	0.1220	2.9000	3.1000
c	0.0090	0.0138	0.2300	0.3500
D	0.2480	0.2640	6.3000	6.7000
E	0.2637	0.2874	6.7000	7.3000
E1	0.1290	0.1460	3.3000	3.7000
e	0.0866	0.0945	2.2000	2.4000
L	0.0295	0.0492	0.7500	1.2500
θ	0°	10°	0°	10°



■ Marking Information



Note:

1. All marking is at middle of the product body
2. All marking is in laser printing
3. M034P04A is marking code
4. Body color: Black



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