

N-Channel Enhancement Mode Power MOSFET

MTN6680Q8

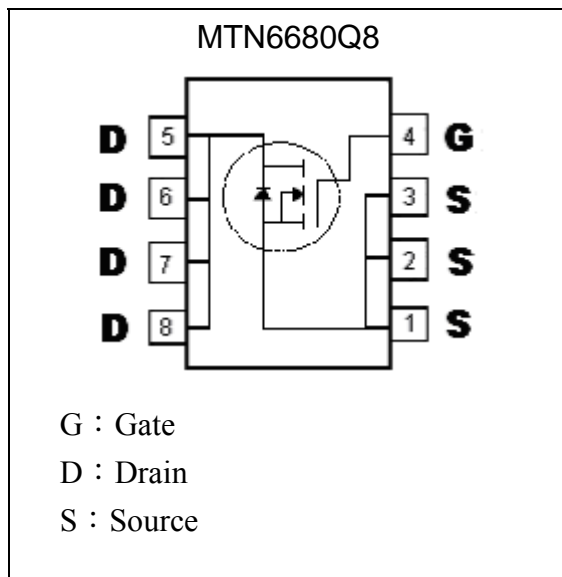
Description

The MTN6680Q8 is a N-channel enhancement-mode MOSFET, providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost effectiveness. The SOP-8 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

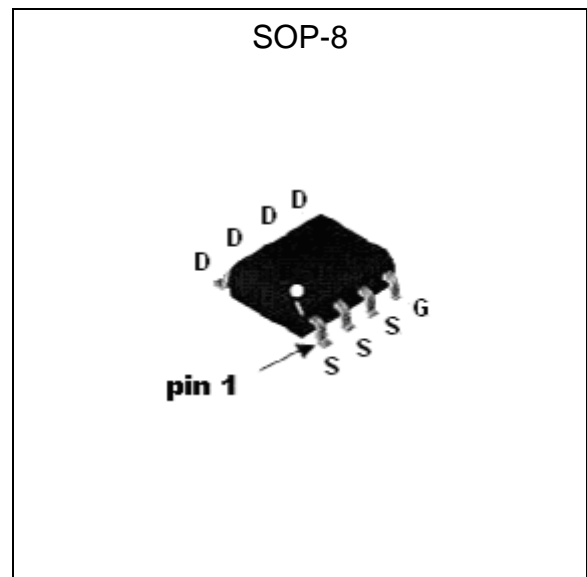
Features

- Single Drive Requirement
- Low On-resistance
- Fast Switching Characteristic
- Dynamic dv/dt rating
- Repetitive Avalanche Rated
- Pb-free package

Symbol



Outline





Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current @V _{GS} =10V, T _A =25°C	I _D	11.5 *1	A
Continuous Drain Current @V _{GS} =10V, T _A =70°C	I _D	9.5 *1	A
Pulsed Drain Current	I _{DM}	50 *2	A
Total Power Dissipation	P _D	2.5	W
Linear Derating Factor		0.02	W/°C
Thermal Resistance, Junction-to-ambient, max	R _{th,j-a}	50 *1	°C/W
Operating Junction and Storage Temperature	T _j , T _{stg}	-55~+150	°C

Note : 1. Surface mounted on 1 in² copper pad of FR-4 board, 125°C/W when mounted on minimum copper pad.
 2. Pulse width limited by maximum junction temperature

Characteristics (T_j=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	30	-	-	V	V _{GS} =0, I _D =250µA
ΔBV _{DSS} /ΔT _j	-	0.02	-	V/°C	Reference to 25°C, I _D =1mA
V _{GS(th)}	1.0	-	3.0	V	V _{DS} = V _{GS} , I _D =250µA
G _{FS}	-	30	-	S	V _{DS} =15V, I _D =11.5A
I _{GSS}	-	-	±100	nA	V _{GS} =±20
I _{DSS}	-	-	1	µA	V _{DS} =30V, V _{GS} =0
I _{DSS}	-	-	25	µA	V _{DS} =24V, V _{GS} =0, T _j =70°C
*R _{DS(ON)}	-	-	11	mΩ	V _{GS} =10V, I _D =11.5A
*R _{DS(ON)}	-	-	18	mΩ	V _{GS} =4.5V, I _D =9.5A
Dynamic					
*Q _g	-	16.8	-	nC	I _D =11.5A, V _{DS} =15V, V _{GS} =5V
*Q _{gs}	-	4.2	-		
*Q _{gd}	-	8	-		
*t _{d(ON)}	-	8.9	-	ns	V _{DS} =15V, I _D =1A, V _{GS} =10V, R _G =5.5Ω, R _D =10Ω
*t _r	-	7.3	-		
*t _{d(OFF)}	-	25.6	-		
*t _f	-	18.6	-		
C _{iss}	-	1450	-	pF	V _{GS} =0V, V _{DS} =25V, f=1MHz
C _{oss}	-	285	-		
C _{rss}	-	180	-		
Source-Drain Diode					
*V _{SD}	-	-	1.3	V	I _S =3.5A, V _{GS} =0V
*I _S	-	-	1.92	A	V _D =V _G =0, V _S =1.3V

*Pulse Test : Pulse Width ≤300µs, Duty Cycles≤2%

Characteristic Curves

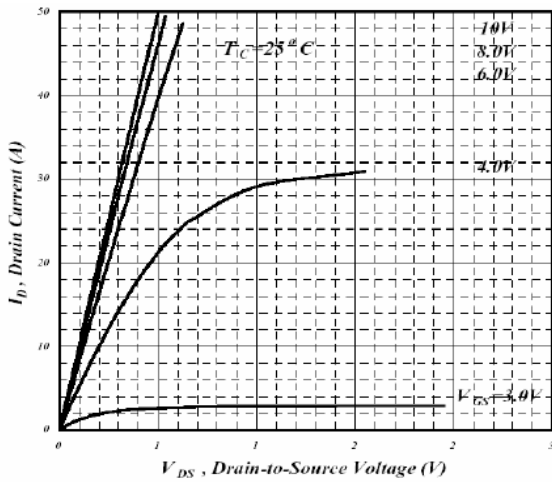


Fig 1. Typical Output Characteristics

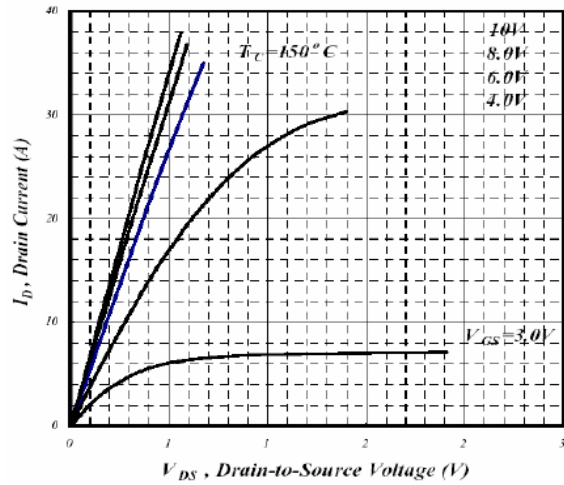


Fig 2. Typical Output Characteristics

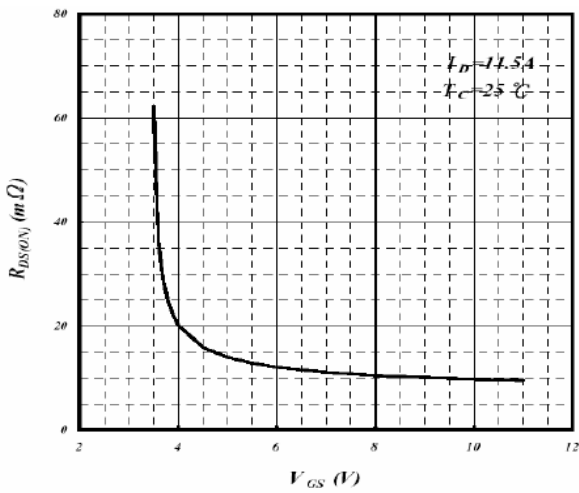


Fig 3. On-Resistance v.s. Gate Voltage

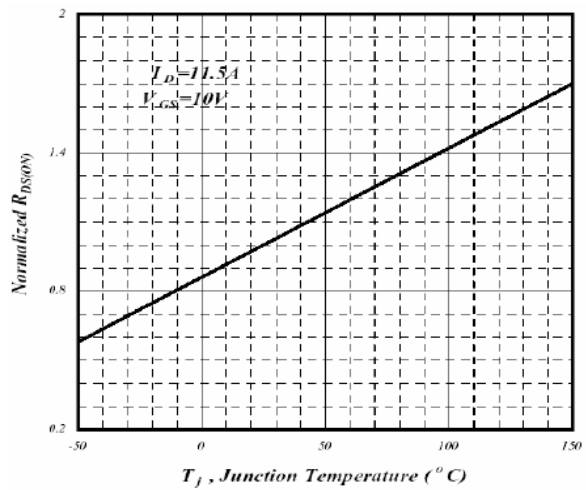


Fig 4. Normalized On-Resistance v.s. Junction Temperature

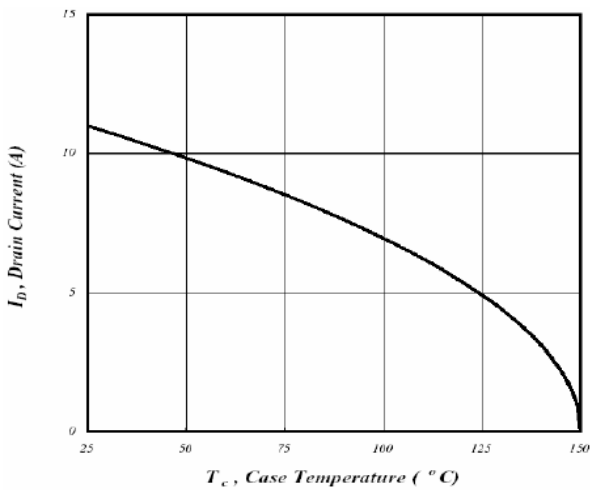


Fig 5. Maximum Drain Current v.s. Case Temperature

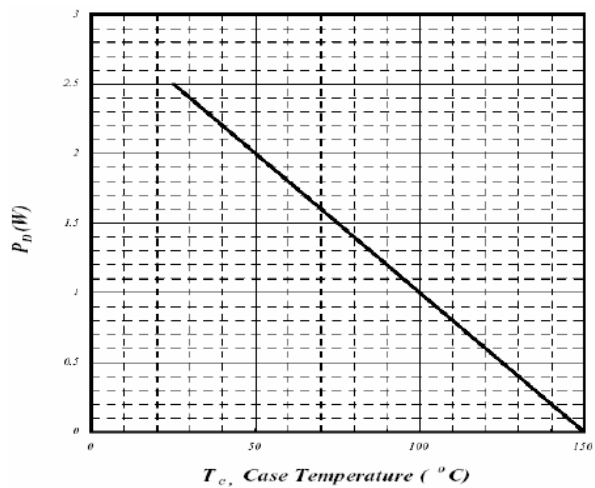


Fig 6. Type Power Dissipation

Characteristic Curves(Cont.)

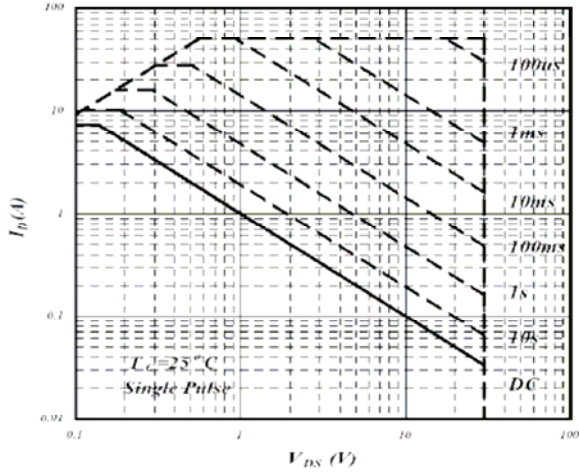


Fig 7. Maximum Safe Operating Area

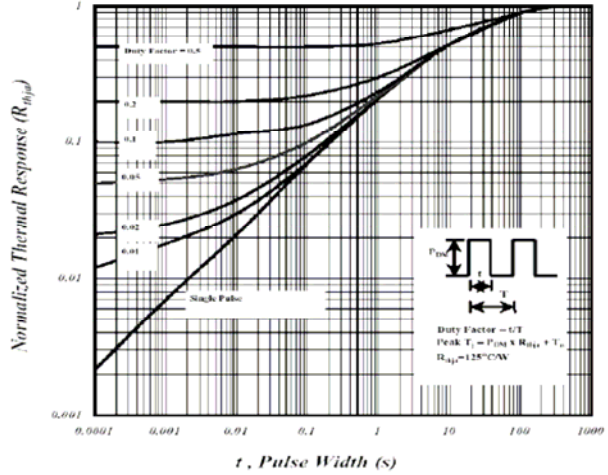


Fig 8. Effective Transient Thermal Impedance

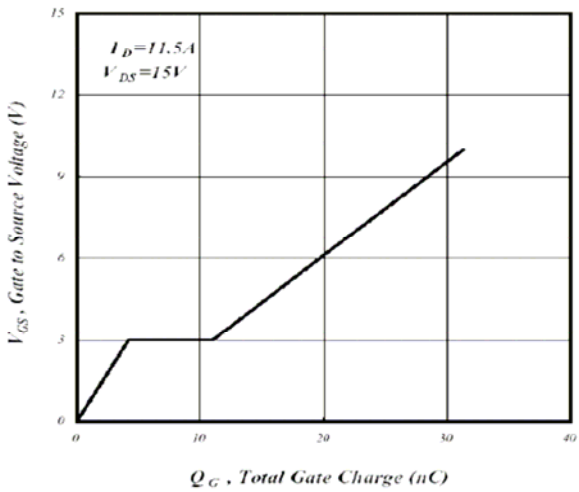


Fig 9. Gate Charge Characteristics

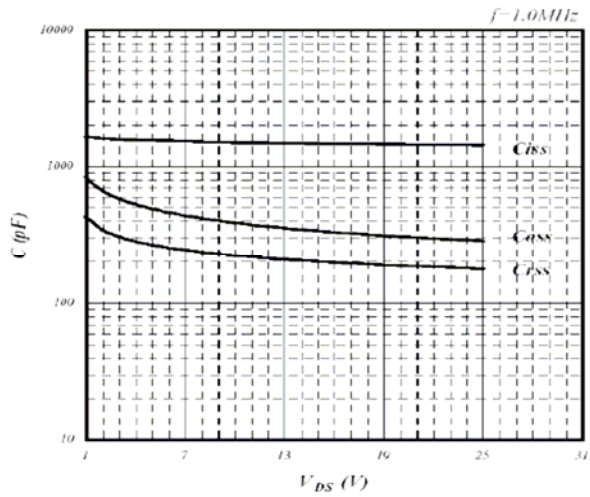


Fig 10. Typical Capacitance Characteristics

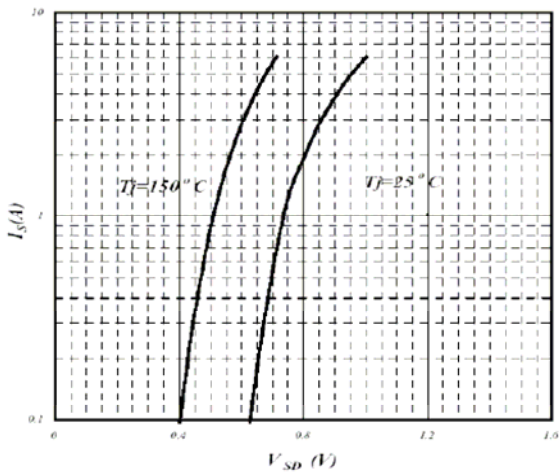


Fig 11. Forward Characteristics of Reverse Diode

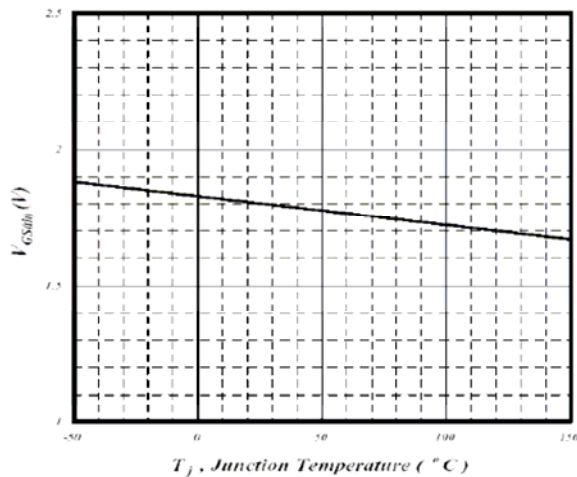


Fig 12. Gate Threshold Voltage v.s. Junction Temperature

Characteristic Curves(Cont.)

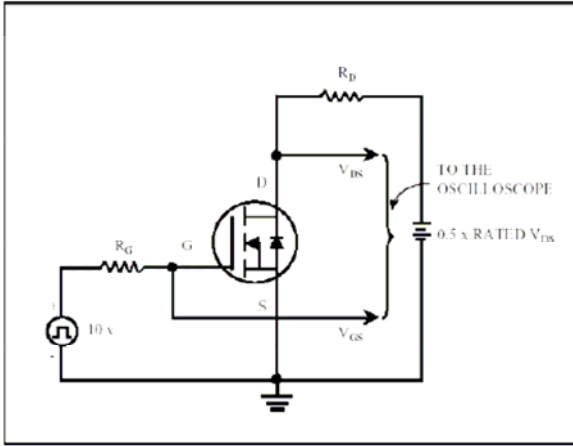


Fig 13. Switching Time Circuit

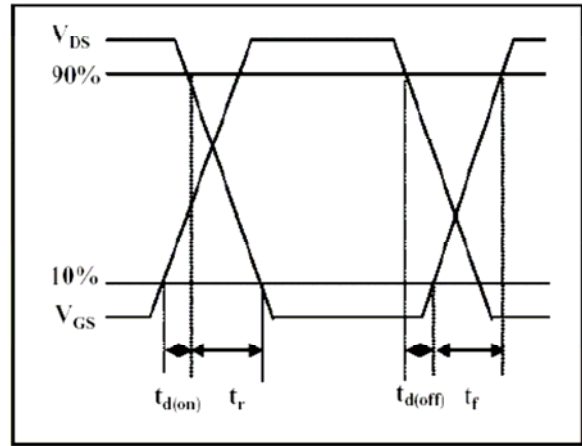


Fig 14. Switching Time Waveform

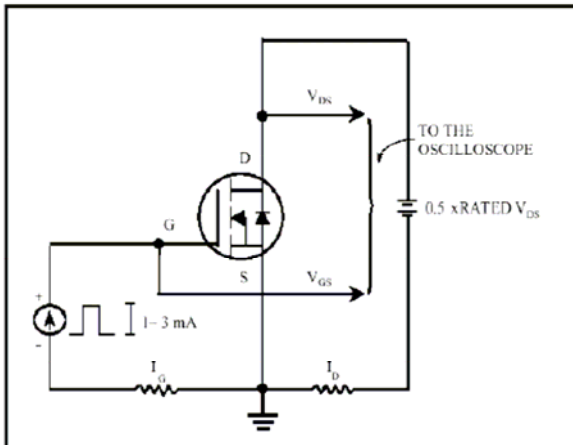


Fig 15. Gate Charge Circuit

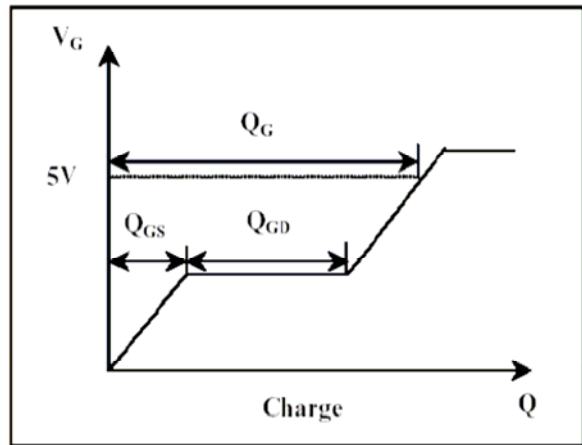
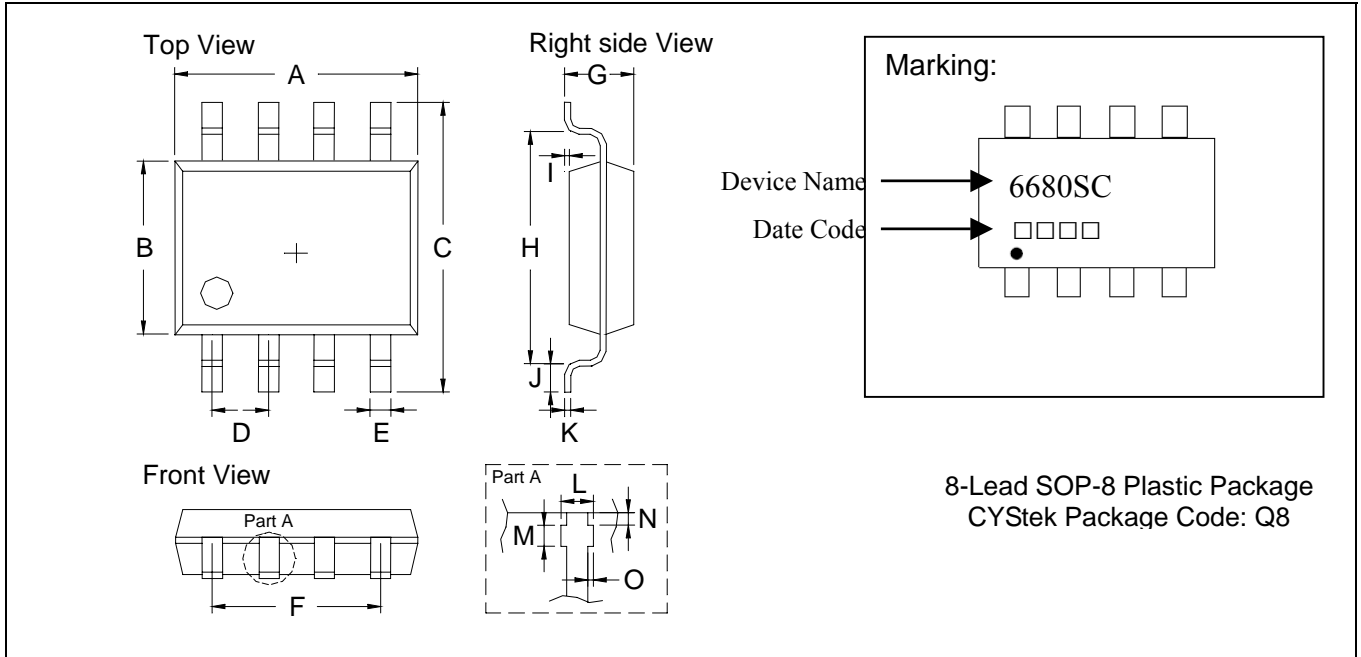


Fig 16. Gate Charge Waveform

SOP-8 Dimension



*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1909	0.2007	4.85	5.10	I	0.0019	0.0078	0.05	0.20
B	0.1515	0.1555	3.85	3.95	J	0.0118	0.0275	0.30	0.70
C	0.2283	0.2441	5.80	6.20	K	0.0074	0.0098	0.19	0.25
D	0.0480	0.0519	1.22	1.32	L	0.0145	0.0204	0.37	0.52
E	0.0145	0.0185	0.37	0.47	M	0.0118	0.0197	0.30	0.50
F	0.1472	0.1527	3.74	3.88	N	0.0031	0.0051	0.08	0.13
G	0.0570	0.0649	1.45	1.65	O	0.0000	0.0059	0.00	0.15
H	0.1889	0.2007	4.80	5.10					

Notes: 1.Controlling dimension: millimeters.
 2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
 3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material:

- Lead: 42 Alloy; solder plating
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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