

## N-Channel MOSFET MEM2310M3

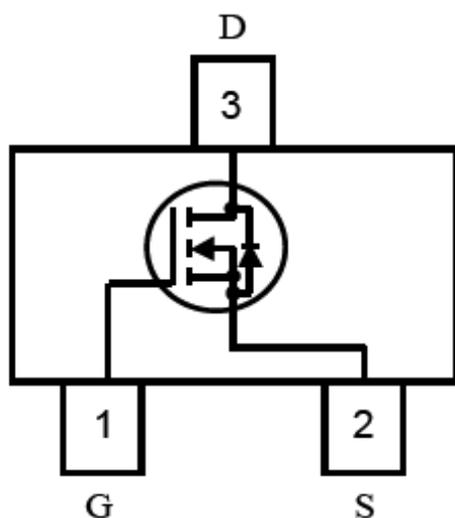
### General Description

MEM2310M3G Series N-channel enhancement mode field-effect transistor, produced with high cell density DMOS trench technology, which is especially used to minimize on-state resistance. This device particularly suits low voltage applications, and low power dissipation in a very small outline surface mount package.

### Features

- 30V/5.8A  
 $R_{DS(ON)} = 25m\Omega @ V_{GS}=10V, I_D=5.8A$   
 $R_{DS(ON)} = 28m\Omega @ V_{GS}=4.5V, I_D=5A$   
 $R_{DS(ON)} = 37m\Omega @ V_{GS}=2.5V, I_D=4A$
- High Density Cell Design For Ultra Low On-Resistance
- Subminiature surface mount package:SOT23-3L

### Pin Configuration



### Typical Application

- Battery management
- High speed switch
- Low power DC to DC converter

### Absolute Maximum Ratings

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		$V_{DSS}$	30V	V
Gate-Source Voltage		$V_{GSS}$	$\pm 12$	V
Drain Current	$T_A=25^\circ C$	$I_D$	5.8	A
	$T_A=70^\circ C$		4.9	
Pulsed Drain Current <sup>1,2</sup>		$I_{DM}$	30	A
Total Power Dissipation	$T_A=25^\circ C$	Pd	1.4	W
	$T_A=70^\circ C$		1	
operating junction temperature		$T_j$	150	$^\circ C$
Storage Temperature Range		$T_{stg}$	-65/150	$^\circ C$

## Thermal Characteristics

Parameter		Symbol	TYP.	MAX.	Unit
Thermal Resistance, Junction-to-Ambient	t≤10s	R $\theta$ JA	65	90	°C/W
Thermal Resistance, Junction-to-Ambient	Steady-State	R $\theta$ JA	85	125	°C/W
Thermal Resistance, Junction-to-Lead	Steady-State	R $\theta$ JL	43	60	°C/W

## Electrical Characteristics

MEM2310M3

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	30	35		V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250uA	0.7	0.88	1.4	V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =12V		0.5	100	nA
		V <sub>DS</sub> =0V, V <sub>GS</sub> =-12V		-0.2	-100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =24V V <sub>GS</sub> =0V			1000	nA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =5.8A		25	30	m $\Omega$
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A		28	33	m $\Omega$
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =4A		37	50	m $\Omega$
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = 5 V, I <sub>D</sub> = 5A	10	15		S
Maximum Body-Diode Continuous Current	I <sub>S</sub>				2.5	A
Source-drain (diode forward) voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =1A		0.72	1.0	V
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0 V, f = 1 MHz		823	1030	pF
Output Capacitance	C <sub>oss</sub>			99		
Reverse Transfer Capacitance	C <sub>rss</sub>			77		
Gate resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz		1.2	3.6	$\Omega$
<b>Switching Characteristics</b>						
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 15 V, R <sub>L</sub> = 2.7 $\Omega$ V <sub>GEN</sub> = 10V, R <sub>g</sub> = 3 $\Omega$		7	14	ns
Rise Time	t <sub>r</sub>			15	30	
Turn-Off Delay Time	t <sub>d(off)</sub>			38	76	
Fall-Time	t <sub>f</sub>			3	6	
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 5.8A		11	14.3	nC
Gate-Source Charge	Q <sub>gs</sub>			1.6	2.08	
Gate-Drain Charge	Q <sub>gd</sub>			2.8	3.64	

1、Repetitive rating, pulse width limited by junction temperature.

2、Pulse width <300us , duty cycle <0.5%.

Typical Performance Characteristics

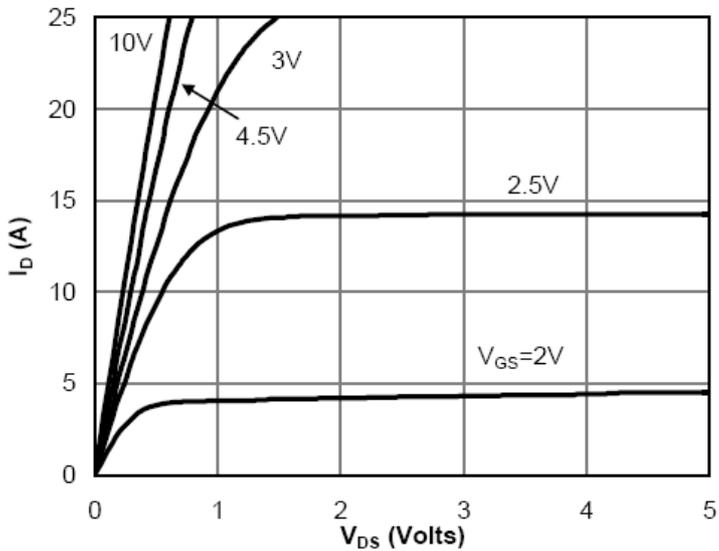


Fig 1: On-Region Characteristics

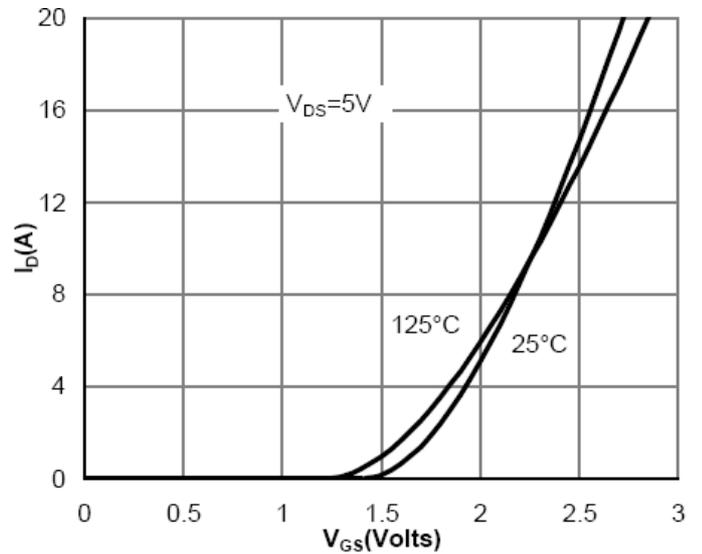


Figure 2: Transfer Characteristics

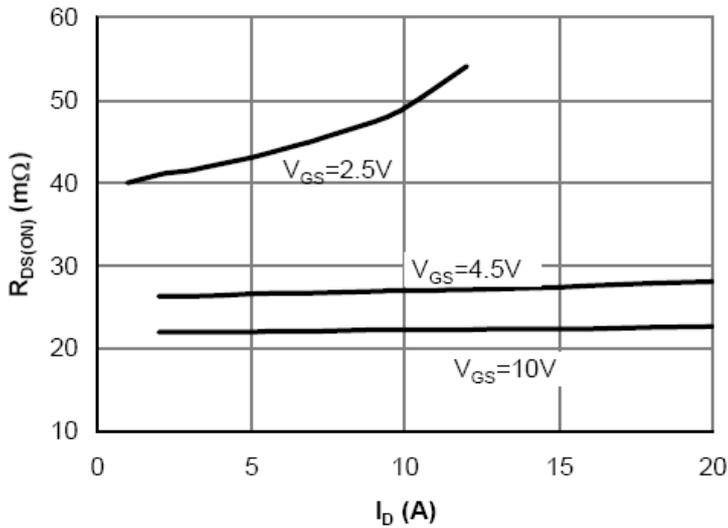


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

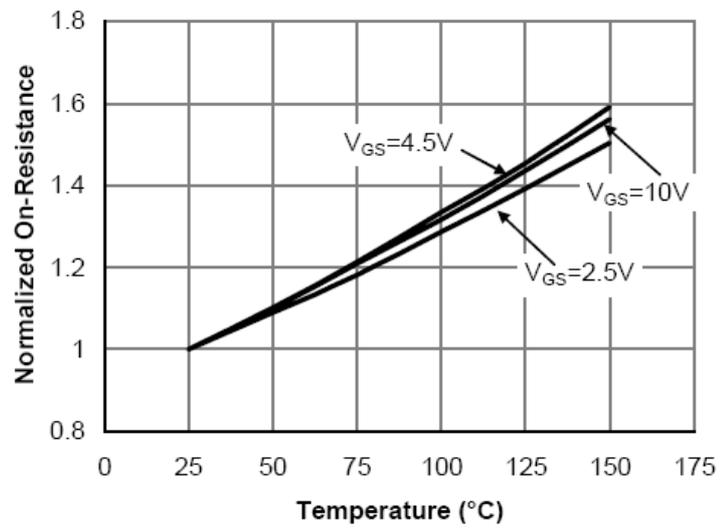


Figure 4: On-Resistance vs. Junction Temperature

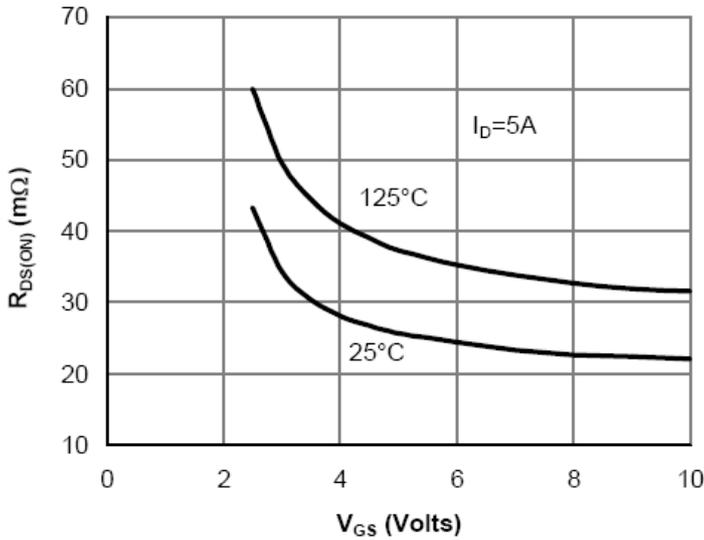


Figure 5: On-Resistance vs. Gate-Source Voltage

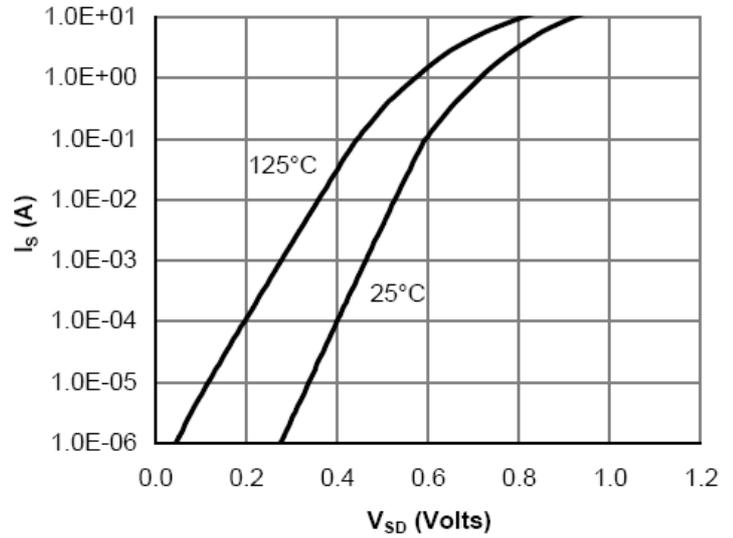


Figure 6: Body-Diode Characteristics

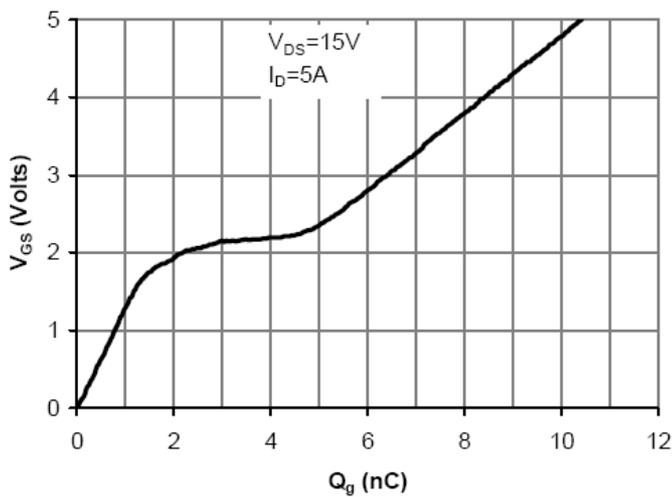


Figure 7: Gate-Charge Characteristics

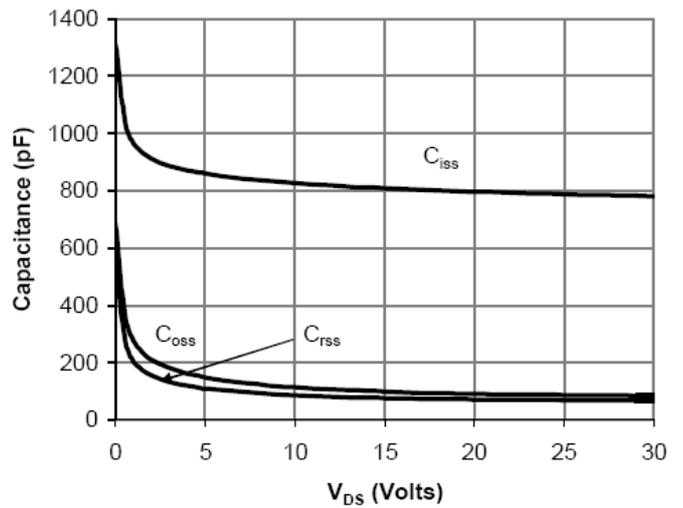


Figure 8: Capacitance Characteristics

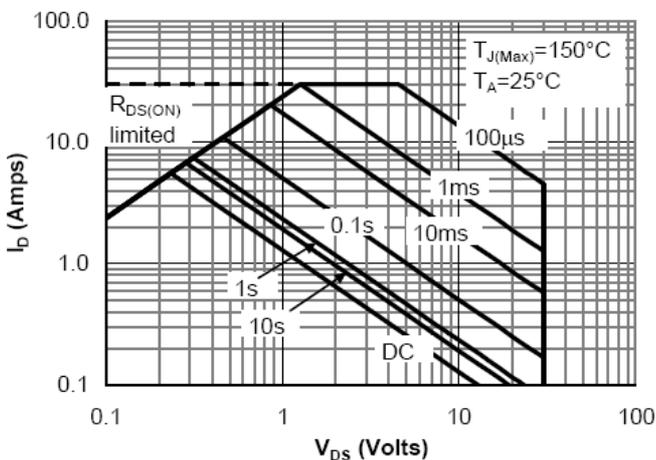


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

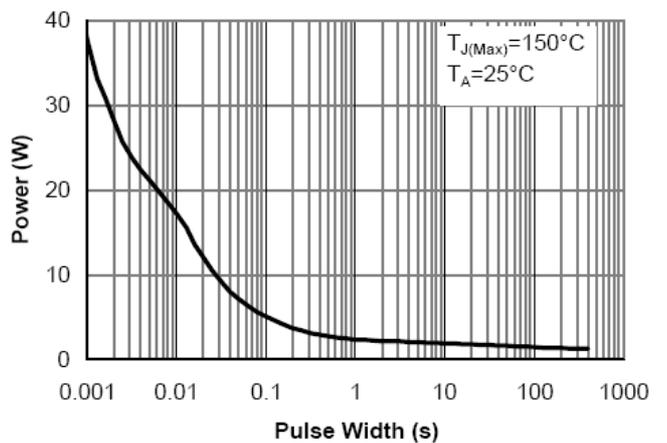


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

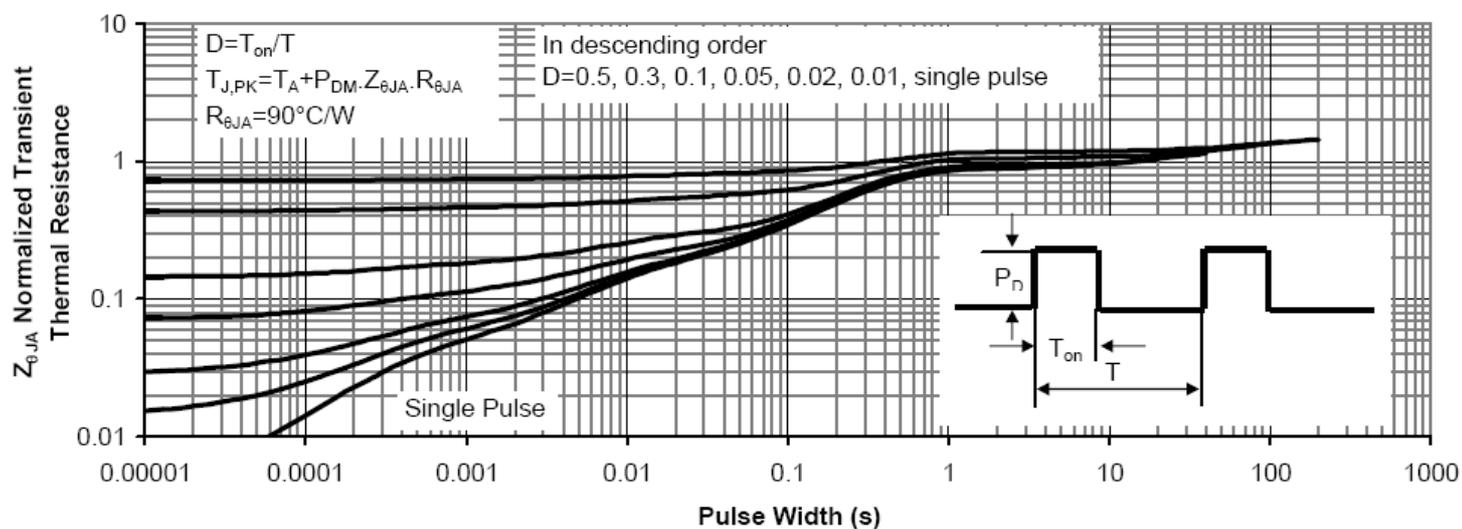
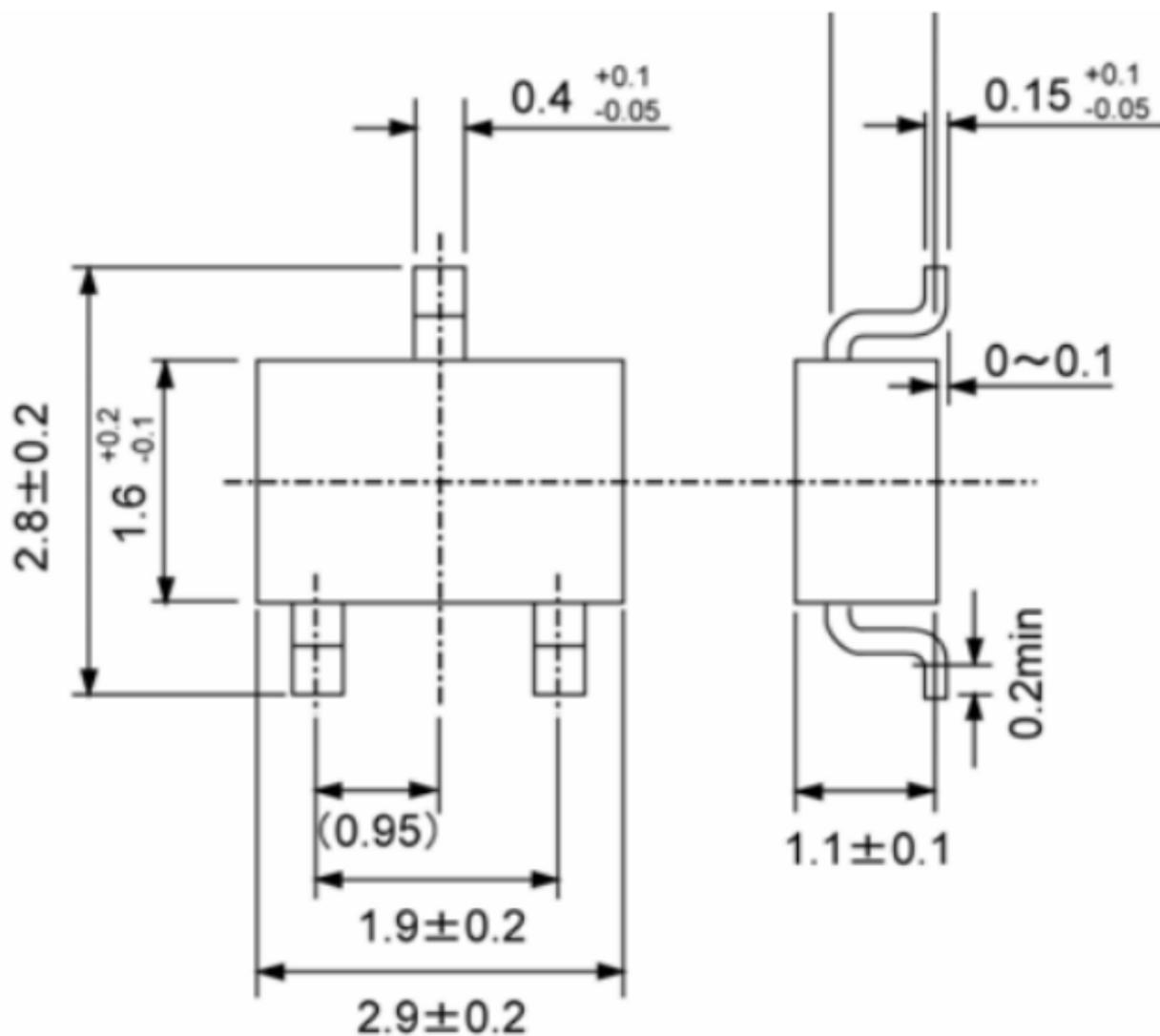


Figure 11: Normalized Maximum Transient Thermal Impedance

Package Information



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