

Bulletin I27145 rev. B 06/02

International
IR Rectifier

**MTP 3-Phase
Rectifier Series**

THREE PHASE BRIDGE

Power Module

Features

- Low V_F
- Low profile package
- Direct Mounting to heatsink
- Flat-Pin/ Round-Pin versions with PCB solderable terminals
- Low junction-to-case Thermal Resistance
- 3500 V_{RMS} insulation voltage
- UL approval pending

Applications: Power conversion machines

- Welding
- UPS
- SMPS
- Motor Drives
- General Purpose & Heavy Duty Applications

Description

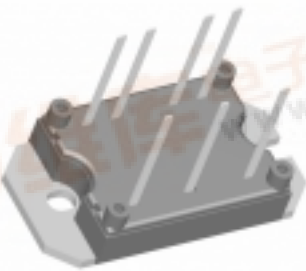
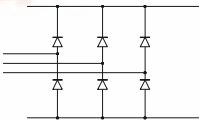
A range of extremely compact three-phase rectifier bridges offering efficient and reliable operation.

The low profile package has been specifically conceived to maximize space saving and optimize the electrical layout of the application specific Power Supplies.

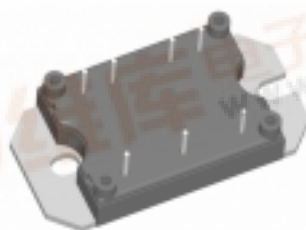
Major Ratings and Characteristics

Parameters	40MT	70MT	100MT	Units
I _O	45	75	100	A
@ T _C	100	80	80	°C
I _{FSM} @ 50Hz	270	380	450	A
@ 60Hz	280	398	470	
I ² t @ 50Hz	365	724	1013	A ² s
@ 60Hz	325	660	920	
I ² /√t	3650	7240	10130	A ² √s
V _{RRM}	1400 & 1600			V
T _{STG} range	-40 to 125			°C
T _J range	-40 to 150			

45 A
75 A
100 A



MT...PA



MT...PB



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ELECTRICAL SPECIFICATIONS

Voltage Ratings

Type number	Voltage Code reverse voltage V	V_{RRM} , maximum repetitive peak reverse voltage V	V_{RSM} , maximum non-repetitive peak V	I_{RRM} max. @ $T_J = 150^\circ\text{C}$ mA
40-70-100MT140P	140	1400	1500	5
40-70-100MT160P	160	1600	1700	

Forward Conduction

Parameter		40MT	70MT	100MT	Units	Conditions			
I _O	Maximum DC output current @ Case temperature	45	75	100	A	120° Rect conduction angle			
		100	80	80	°C				
I _{FSM}	Maximum peak, one-cycle forward, non-repetitive on state surge current	270	380	450	A	t = 10ms	No voltage	Initial T _J = T _J max.	
		280	398	470		t = 8.3ms	reapplied		
		225	320	380		t = 10ms	100% V _{RRM}		
		240	335	400		t = 8.3ms	reapplied		
I ² t	Maximum I ² t for fusing	365	724	1013	A ² s	t = 10ms	No voltage		T _J = T _J max.
		325	660	920		t = 8.3ms	reapplied		
		253	512	600		t = 10ms	100% V _{RRM}		
		240	467	665		t = 8.3ms	reapplied		
I ² √t	Maximum I ² √t for fusing	3650	7240	10130	A ² √s	t = 0.1 to 10ms, no voltage reapplied			
V _{F(TO)}	Value of threshold voltage	0.78	0.82	0.75	V	@ T _J max.			
r _t	Slope resistance	14.8	9.5	8.1	mΩ				
V _{FM}	Maximum forward voltage drop	1.45 I _{pk} = 40A	1.45 I _{pk} = 70A	1.51 I _{pk} = 100A	V	T _J = 25°C t _p = 400μs single junction			

Insulation Table

Parameter	40MT	70MT	100MT	Units	Conditions
V_{INS} RMS insulation voltage	3500			V	$T_J = 25^\circ\text{C}$ all terminal shorted $f = 50\text{Hz}$, t = 1s

Thermal and Mechanical Specifications

Parameter	40MT	70MT	100MT	Units	Conditions
T_J Maximum junction operating temperature range	- 40 to 150			°C	
T_{stg} Maximum storage temperature range	-40 to 125			°C	
R_{thJC} Maximum thermal resistance, junction to case	0.27	0.23	0.19	K/W	DC operation per module
	1.6	1.38	1.14		DC operation per junction
	0.38	0.29	0.22		120° Rect conduction angle per module
	2.25	1.76	1.29		120° Rect conduction angle per junction
R_{thCS} Maximum thermal resistance, case to heatsink	0.1			K/W	Per module. Mounting surface smooth, flat and greased. Heatsink compound thermal conductivity = 0.42W/mK
T Mounting torque $\pm 10\%$ to heatsink	4			Nm	A mounting compound is recommended and the torque should be rechecked after a period of 3 hours to allow for the spread of the compound.
wt Approximate weight	65			g	Lubricated threads.

Clearance and Creepage Distances

Parameter	MT...PA	MT...PB	Units
Clearance (external shortest distance in air between terminals which are not internally short circuited together)	10.9	12.3	mm
Creepage distance (shortest distance along external surface of the insulating material between terminals which are not internally short circuited together)	10.9	12.3	mm

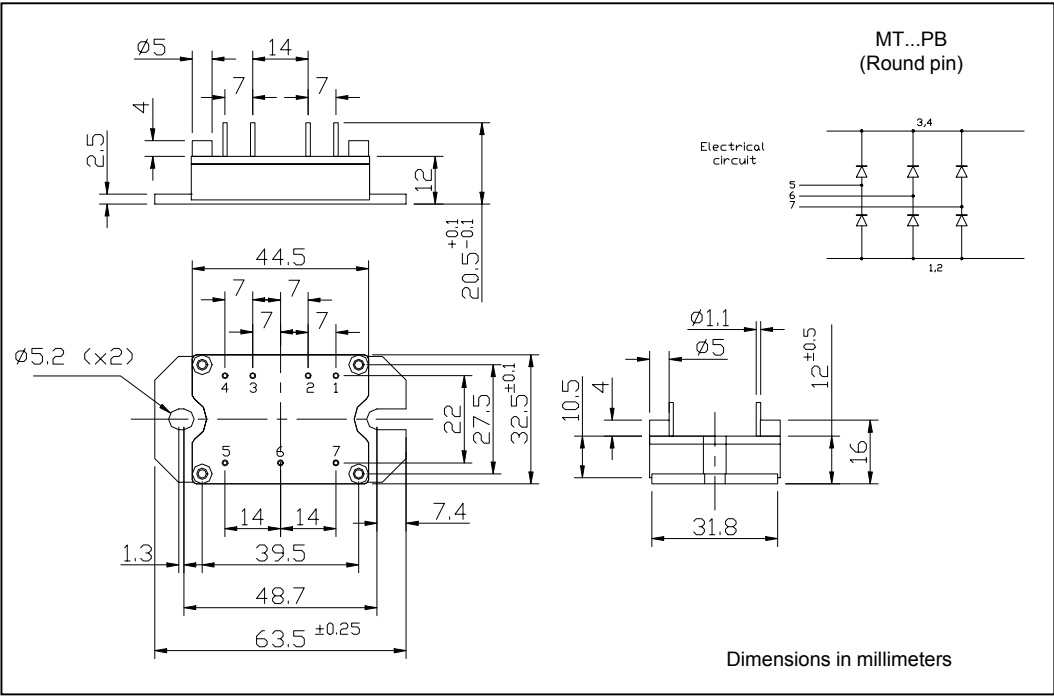
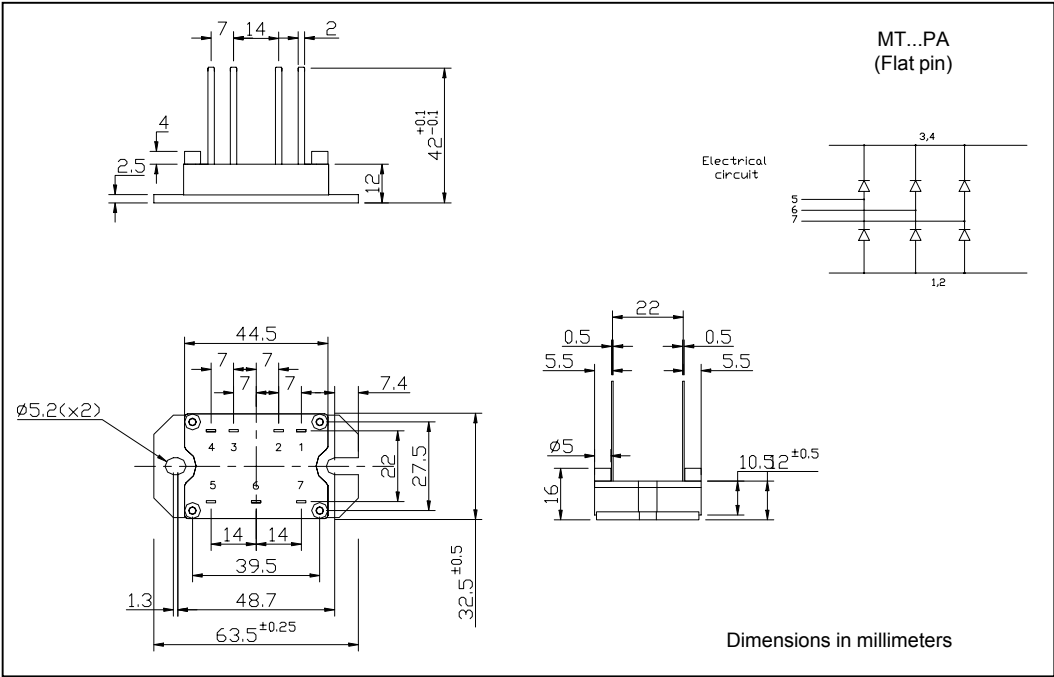
Ordering Information Table

Device Code					
	10	0	MT	160	P B
	1	2	3	4	5
1 - Current rating code	4 = 45A 7 = 75A 10 = 100A				
2 - Circuit configuration code: 0 = 3-Phase Rectifier Bridge					
3 - Essential part number					
4 - Voltage code: code x 10 = V_{RRM} (See Voltage Ratings table)					
5 - Pinout code:	A = Flat pins B = Round pins				

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Outline Table



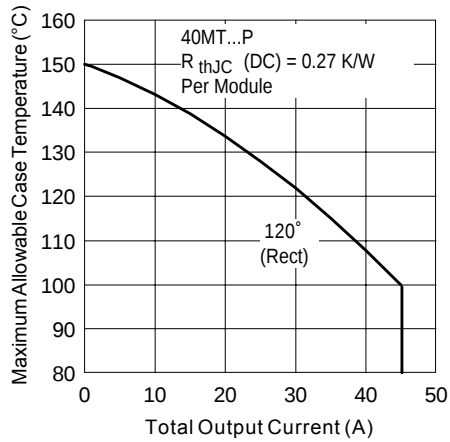


Fig. 1 - Current Rating Characteristics

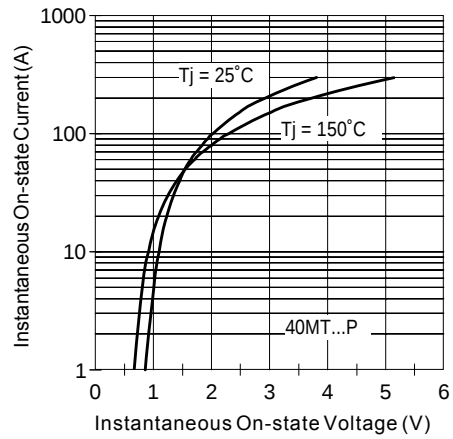


Fig. 2 - On-state Voltage Drop Characteristics

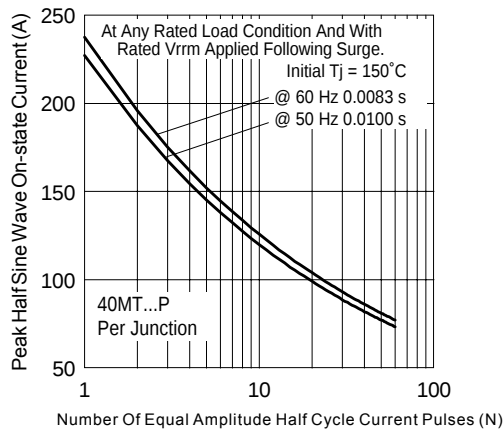


Fig. 3 - Maximum Non-Repetitive Surge Current

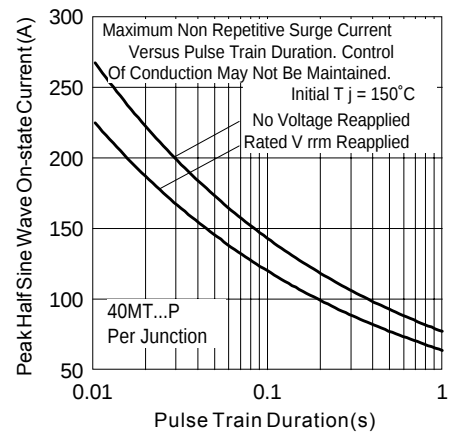


Fig. 4 - Maximum Non-Repetitive Surge Current

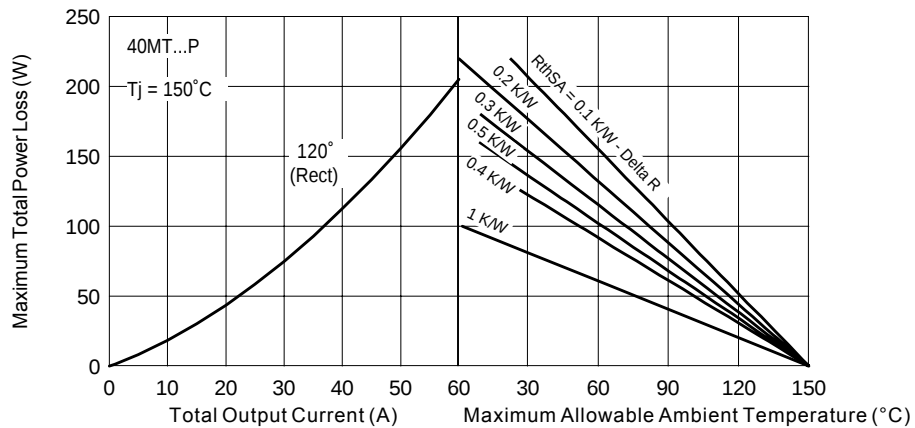


Fig. 5 - Current Rating Nomogram (1 Module Per Heatsink)

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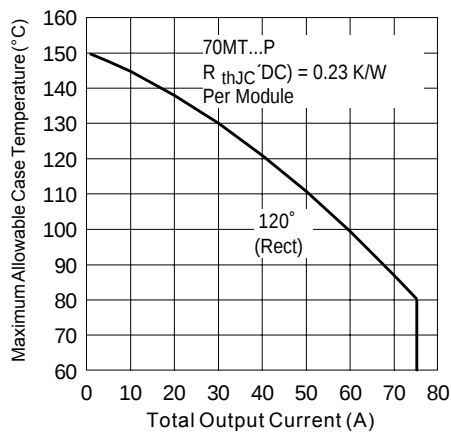


Fig. 6 - Current Rating Characteristics

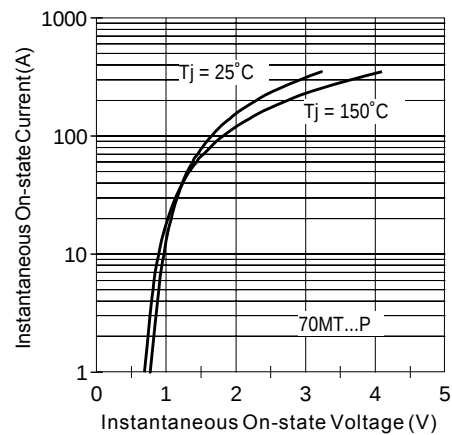


Fig. 7 - On-state Voltage Drop Characteristics

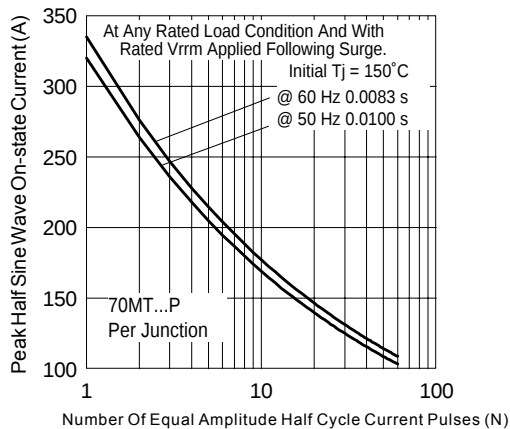


Fig. 8 - Maximum Non-Repetitive Surge Current

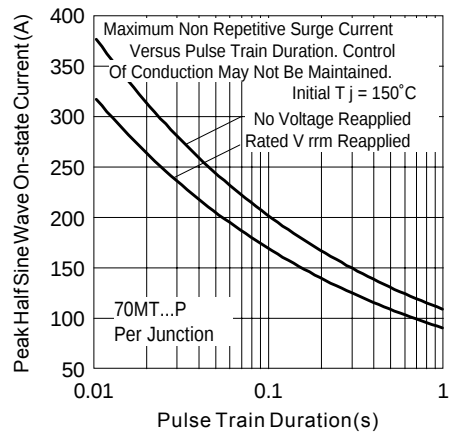


Fig. 9 - Maximum Non-Repetitive Surge Current

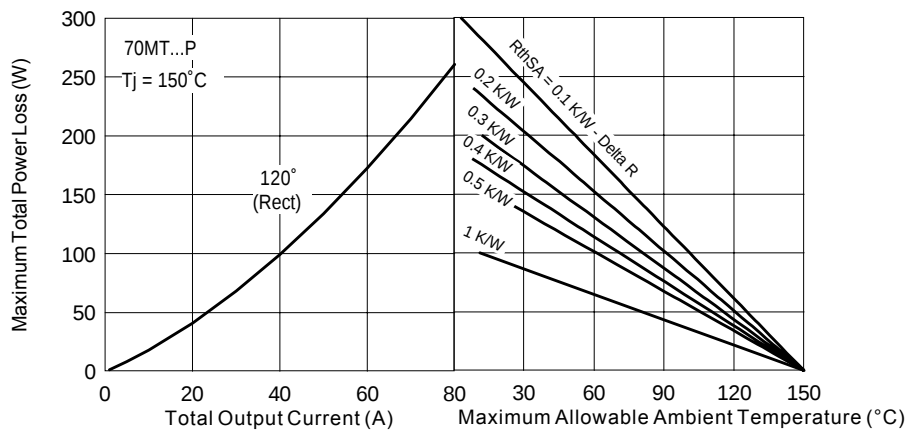


Fig. 10 - Current Rating Nomogram (1 Module Per Heatsink)

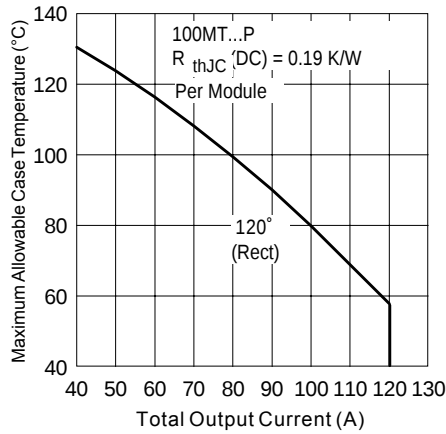


Fig. 11 - Current Rating Characteristics

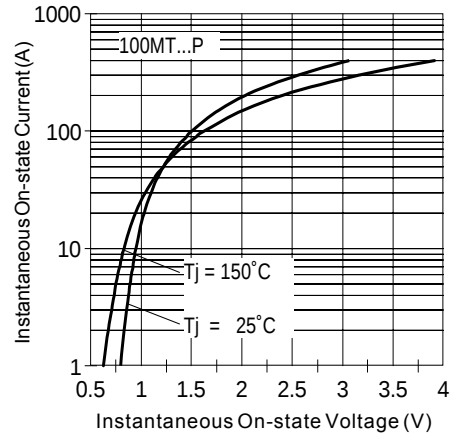


Fig. 12 - On-state Voltage Drop Characteristics

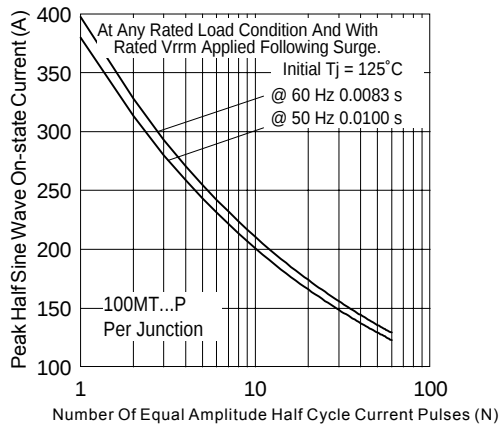


Fig. 13 - Maximum Non-Repetitive Surge Current

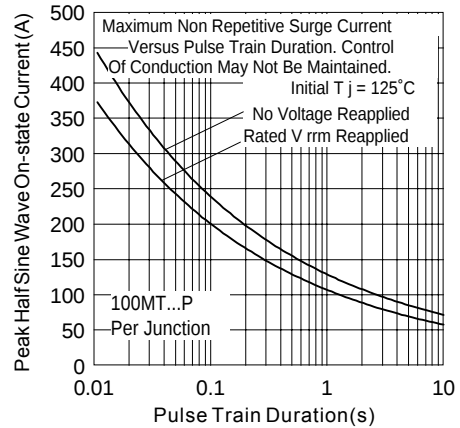


Fig. 14 - Maximum Non-Repetitive Surge Current

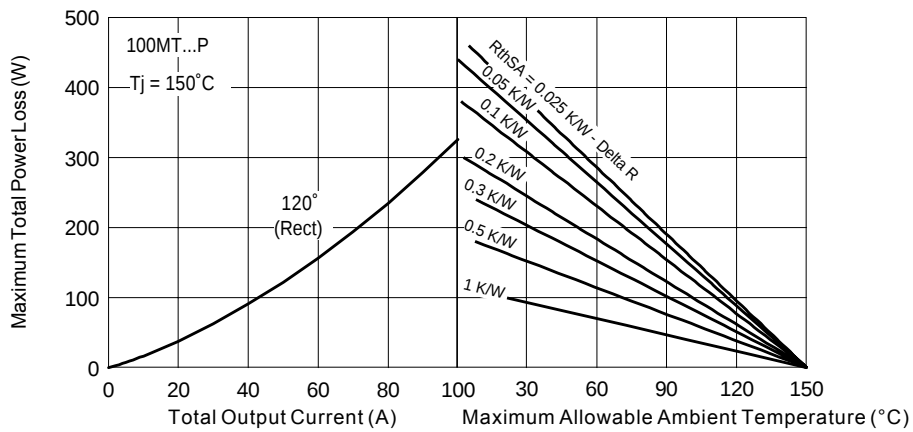


Fig. 15 - Current Rating Nomogram (1 Module Per Heatsink)

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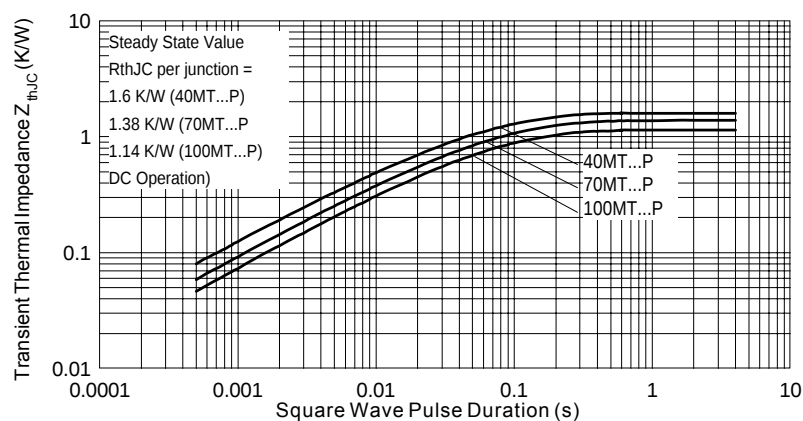


Fig. 16 - Thermal Impedance Z_{thJC} Characteristics

Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level.
Qualification Standards can be found on IR's Web site.

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