Ordering number : ENA1315A

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

N-Channel Silicon MOSFET

EMH2412 — General-Purpose Switching Device Applications

Features

- Low ON-resistance
- Best suited for LiB charging and discharging switch
- Common-drain type
- 2.5V drive
- Halogen free compliance
- Protection diode in

Specifications

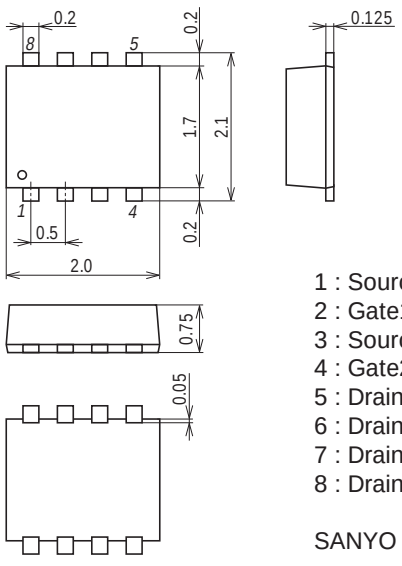
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		24	V
Gate-to-Source Voltage	V_{GSS}		±12	V
Drain Current (DC)	I_D		6	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	60	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (900mm^2×0.8mm) 1unit	1.3	W
Total Dissipation	P_T	When mounted on ceramic substrate (900mm^2×0.8mm)	1.4	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C

Package Dimensions

unit : mm (typ)

7045-006



EMH2412-TL-H

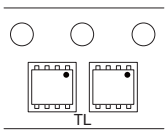
1 : Source1
2 : Gate1
3 : Source2
4 : Gate2
5 : Drain
6 : Drain
7 : Drain
8 : Drain

SANYO : EMH8

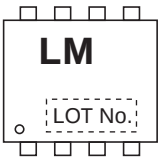
Product & Package Information

- Package : EMH8
- JEITA, JEDEC : -
- Minimum Packing Quantity : 3,000 pcs./reel

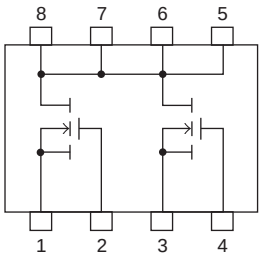
Taping Type : TL



Marking



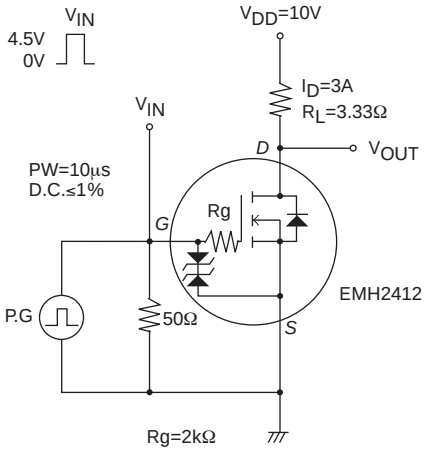
Electrical Connection



Electrical Characteristics at Ta=25°C

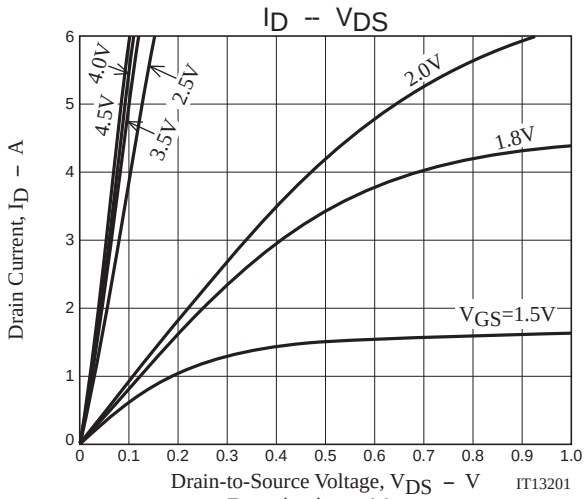
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	24			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V			−1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	0.5		1.3	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=3A	2.8	4.8		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=3A, V_{GS}=4.5V	16	21	27	mΩ
	R_{DS}(on)2	I_D=3A, V_{GS}=4V	17	22	29	mΩ
	R_{DS}(on)3	I_D=3A, V_{GS}=3.1V	18	25	34	mΩ
	R_{DS}(on)4	I_D=1.5A, V_{GS}=2.5V	21	30	42	mΩ
Turn-ON Delay Time	t_{d}(on)	See specified Test Circuit.		310		ns
Rise Time	t_r			1020		ns
Turn-OFF Delay Time	t_{d}(off)			3000		ns
Fall Time	t_f			2250		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=4.5V, I_D=6A		6.3		nC
Gate-to-Source Charge	Qgs			0.83		nC
Gate-to-Drain “Miller” Charge	Qgd			1.9		nC
Diode Forward Voltage	V_{SD}	I_S=6A, V_{GS}=0V		0.8	1.2	V

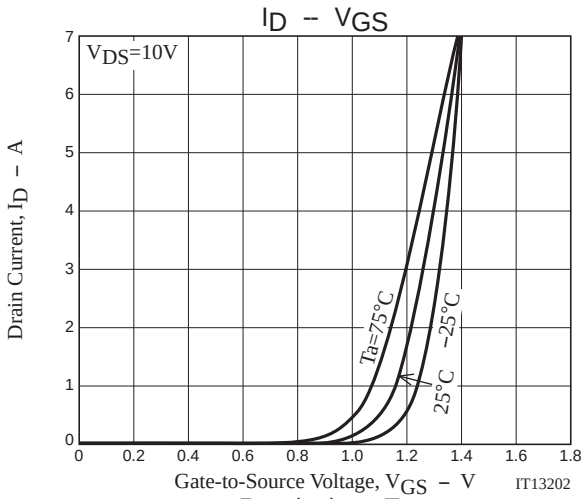
Switching Time Test Circuit

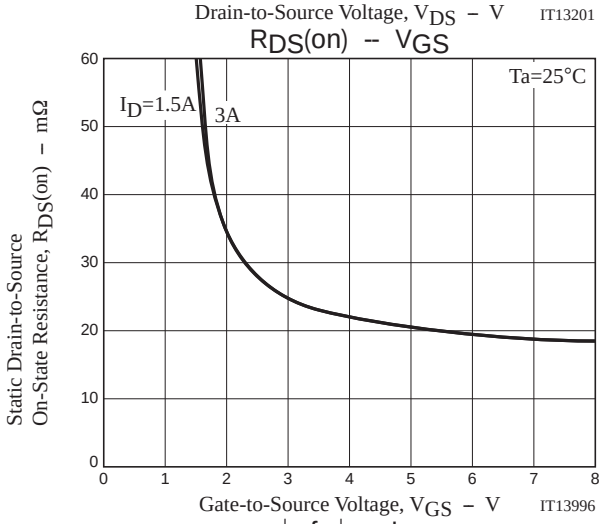


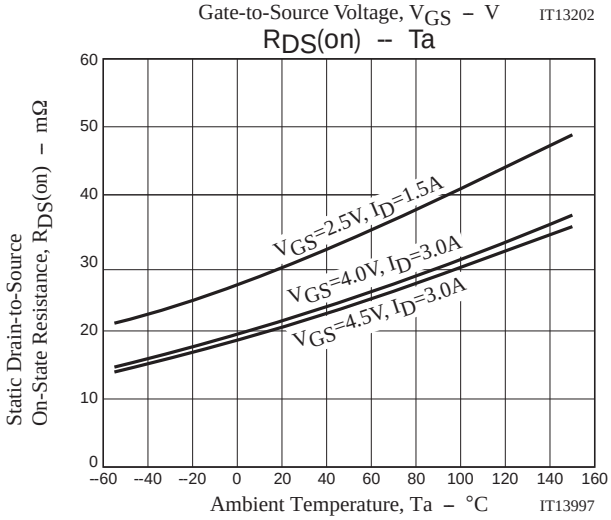
Ordering Information

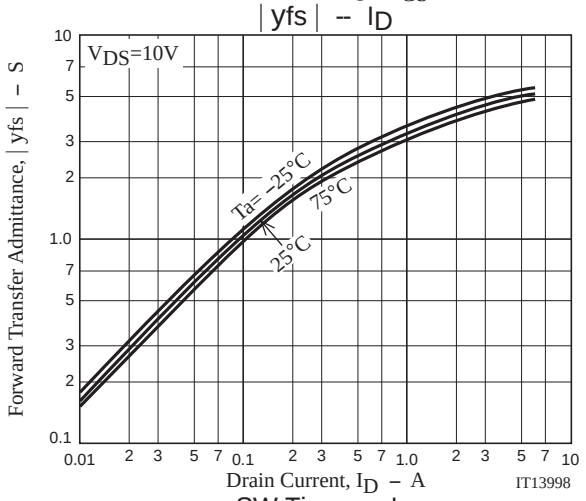
Device	Package	Shipping	memo
EMH2412-TL-H	EMH8	3,000pcs./reel	Pb Free and Halogen Free

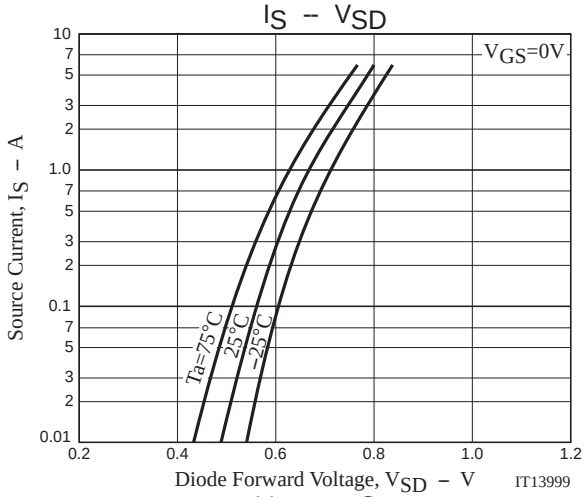

ID -- VDS
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT13201
4.0V
4.5V
3.5V
2.5V
2.0V
1.8V
VGS=1.5V

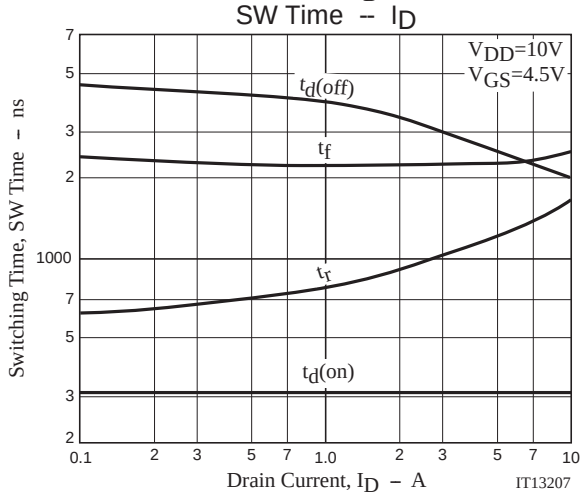

ID -- VGS
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT13202
VDS=10V
Ta=75°C
25°C
–25°C

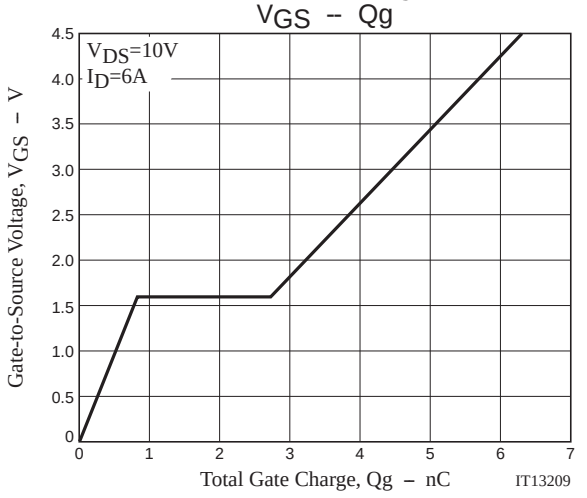

RDS(on) -- VGS
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT13996
Ta=25°C
ID=1.5A
3A

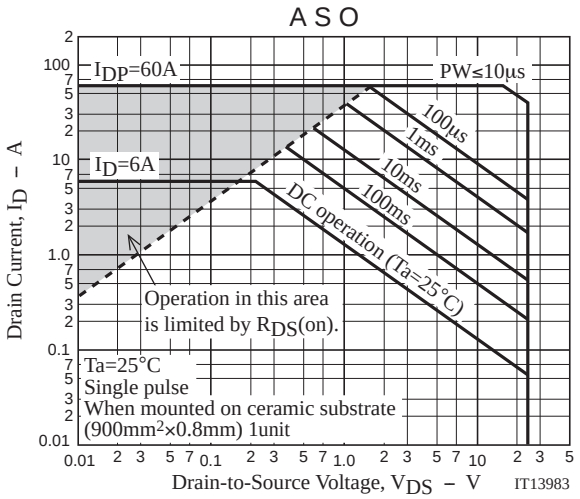

RDS(on) -- Ta
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT13997
VGS=2.5V, ID=1.5A
VGS=4.0V, ID=3.0A
VGS=4.5V, ID=3.0A

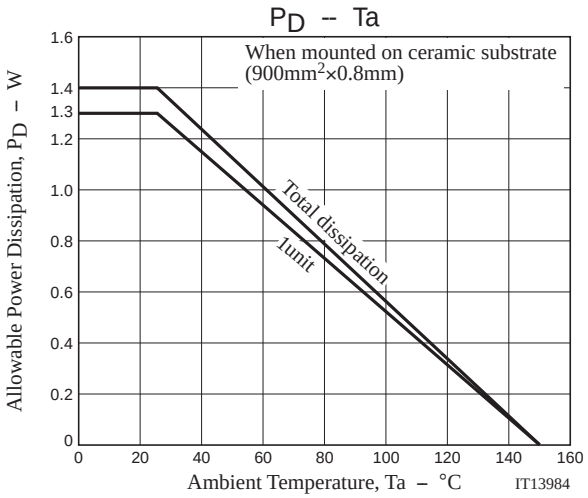

| yfs | -- ID
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT13998
VDS=10V
Ta= –25°C
75°C
25°C


IS -- VSD
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT13999
VGS=0V
Ta=75°C
25°C
–25°C


SW Time -- ID
Switching Time, SW Time – ns
Drain Current, ID – A
IT13207
VDD=10V
VGS=4.5V
td(off)
tf
tr
td(on)


VGS -- Qg
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT13209
VDS=10V
ID=6A


A S O
I_{DP}=60A
PW≤10μs
100μs
1ms
10ms
100ms
DC operation (Ta=25°C)
I_D=6A
Operation in this area
is limited by R_{DS}(on).
Ta=25°C
Single pulse
When mounted on ceramic substrate
(900mm²×0.8mm) 1unit
Drain Current, I_D – A
Drain-to-Source Voltage, V_{DS} – V
IT13983


P_D – Ta
When mounted on ceramic substrate
(900mm²×0.8mm)
Total dissipation
1unit
Allowable Power Dissipation, P_D – W
Ambient Temperature, Ta – °C
IT13984

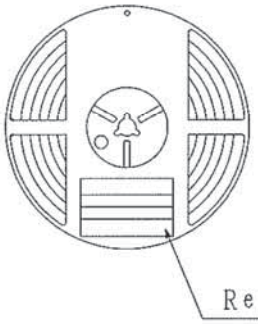
Embossed Taping Specification

EMH2412-TL-H

1. Packing Format

Package Name	Carrier Tape Type	Maximum Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	Inner BOX (C-1)	Outer BOX (A-7)
EMH8	MCP4	3,000	15,000	90,000	5 reels contained Dimensions:mm (external) 183×72×185	6 inner boxes contained Dimensions:mm (external) 440×195×210

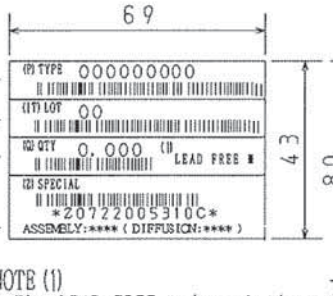
Packing method



Reel label

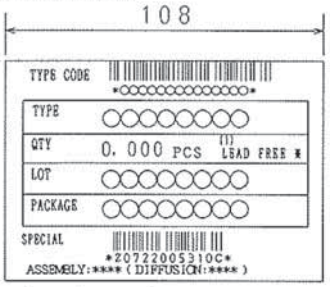
Reel label, Inner box label

(unit:mm)



Outer box label

It is a label at the time of factory shipments. The form of a label may change in physical distribution process.



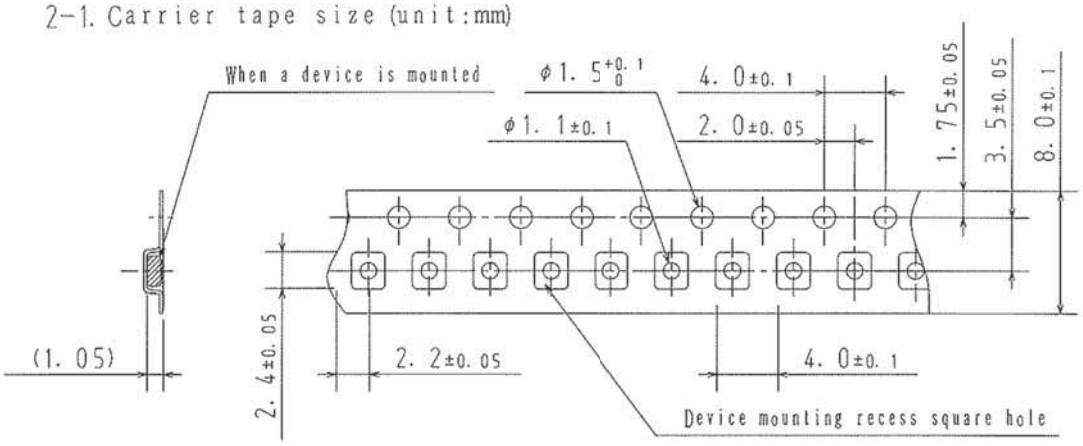
NOTE (1)

The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

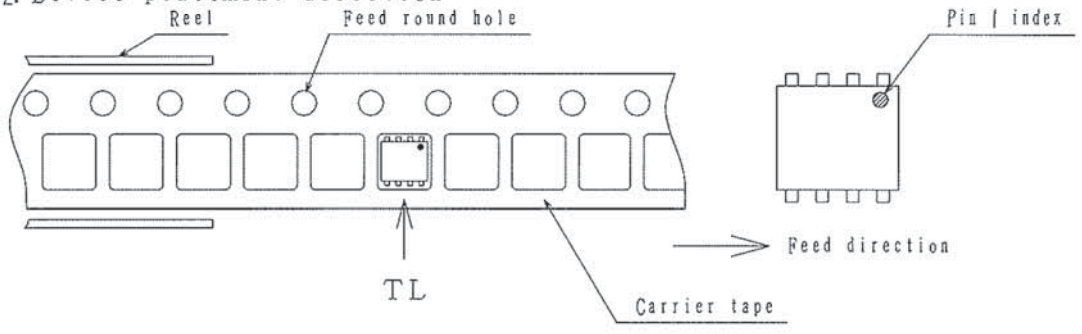
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

2-1. Carrier tape size (unit:mm)



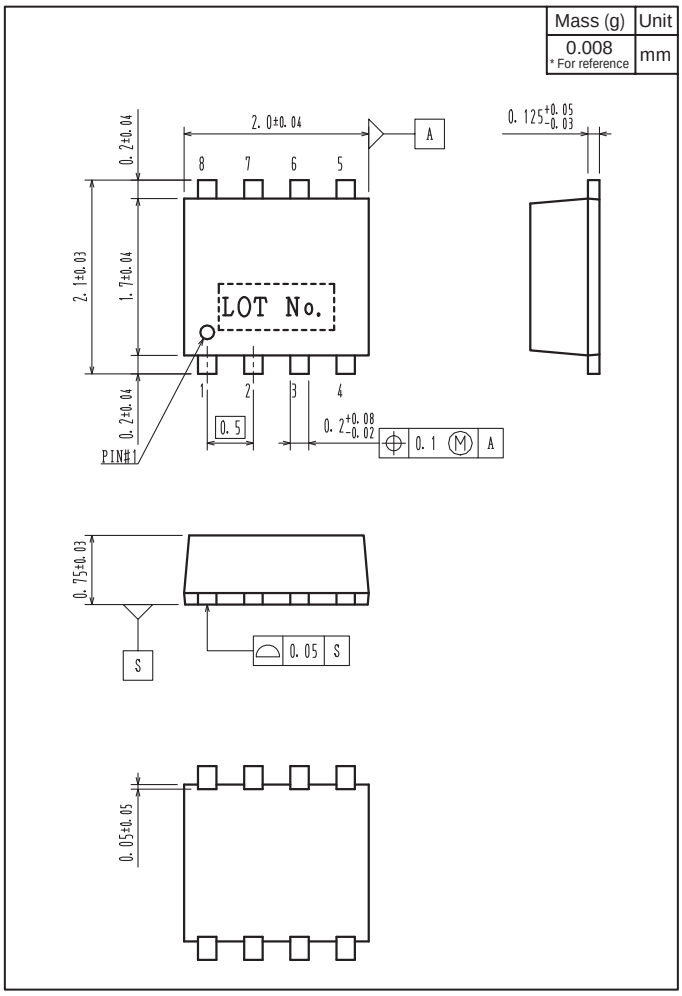
2-2. Device placement direction



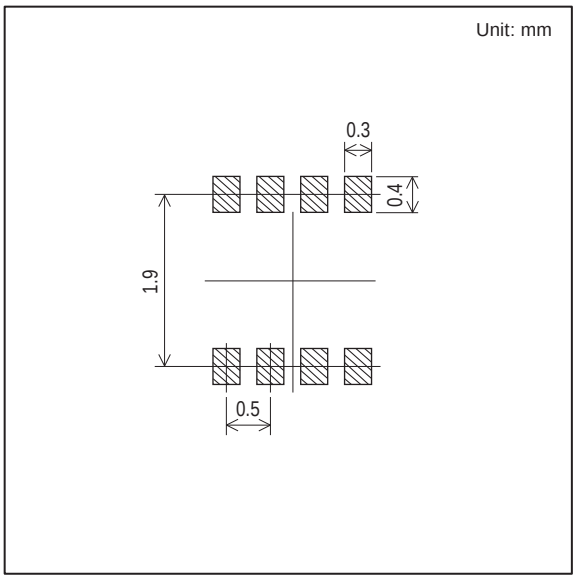
Those with pin 1 index on the feed hole side·····TL

Outline Drawing

EMH2412-TL-H



Land Pattern Example



Note on usage : Since the EMH2412 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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