



2SK4099LS

N-Channel Power MOSFET 600V, 8.5A, 0.94Ω, TO-220F-3FS

ON Semiconductor®

<http://onsemi.com>

Features

- ON-resistance $R_{DS(on)}=0.72\Omega$ (typ.)
- 10V drive
- Input capacitance $C_{iss}=750\text{pF}$

Specifications

Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Drain to Source Voltage	V_{DSS}		600	V
Gate to Source Voltage	V_{GSS}		± 30	V
Drain Current (DC)	I_{DC}^{*1}	Limited only by maximum temperature $T_{ch}=150^\circ\text{C}$	8.5	A
	I_{Dpack}^{*2}	$T_c=25^\circ\text{C}$ (Our ideal heat dissipation condition)*3	6.9	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	34	A
Allowable Power Dissipation	P_D		2.0	W
		$T_c=25^\circ\text{C}$ (Our ideal heat dissipation condition)*3	35	W
Channel Temperature	T_{ch}		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to $+150$	$^\circ\text{C}$
Avalanche Energy (Single Pulse) *4	E_{AS}		197	mJ
Avalanche Current *5	I_{AV}		8.5	A

Note : *1 Shows chip capability

*2 Package limited

*3 Our condition is radiation from backside.

The method is applying silicone grease to the backside of the device and attaching the device to water-cooled radiator made of aluminium.

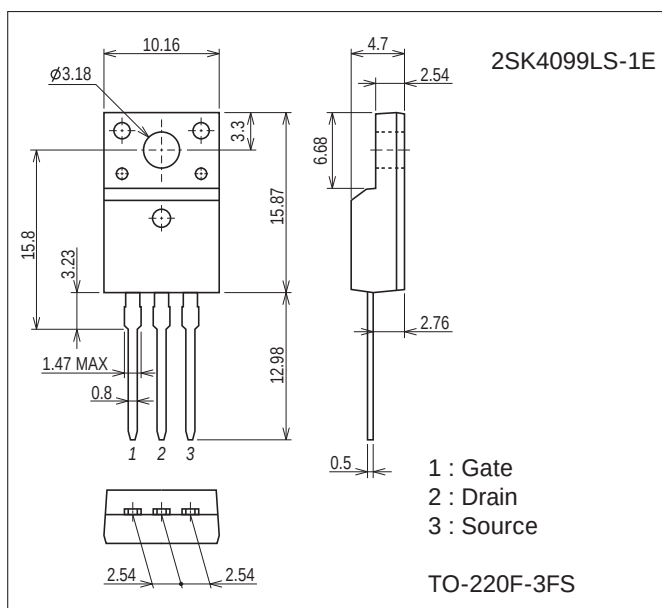
*4 $V_{DD}=50\text{V}$, $L=1\text{mH}$, $I_{AV}=8.5\text{A}$ (Fig.1)*5 $L \leq 5\text{mH}$, single pulse

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Package Dimensions

unit : mm (typ)

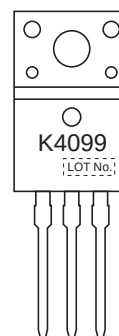
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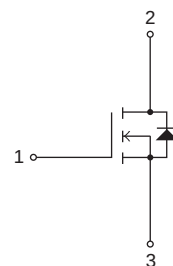
Ordering & Package Information

Device	Package	Shipping	memo
2SK4099LS-1E	TO-220F-3FS, SC-67	50pcs./tube	Pb-Free

Marking



Electrical Connection



2SK4099LS

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=10mA, V_{GS}=0V$	600			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=480V, V_{GS}=0V$			100	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$			± 100	nA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10V, I_D=1mA$	3		5	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10V, I_D=4A$	2.7	5.4		S
Static Drain to Source On-State Resistance	$R_{DS(on)}$	$I_D=4A, V_{GS}=10V$		0.72	0.94	Ω
Input Capacitance	C_{iss}	$V_{DS}=30V, f=1MHz$		750		pF
Output Capacitance	C_{oss}			140		pF
Reverse Transfer Capacitance	C_{rss}			31		pF
Turn-ON Delay Time	$t_{d(on)}$	See Fig.2		16		ns
Rise Time	t_r			37		ns
Turn-OFF Delay Time	$t_{d(off)}$			106		ns
Fall Time	t_f			41		ns
Total Gate Charge	Q_g	$V_{DS}=200V, V_{GS}=10V, I_D=8.5A$		29		nC
Gate to Source Charge	Q_{gs}			5.2		nC
Gate to Drain "Miller" Charge	Q_{gd}			16.5		nC
Diode Forward Voltage	V_{SD}	$I_S=8.5A, V_{GS}=0V$		0.9	1.2	V

Fig.1 Unclamped Inductive Switching Test Circuit

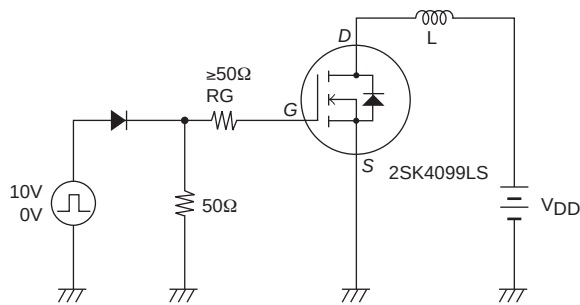
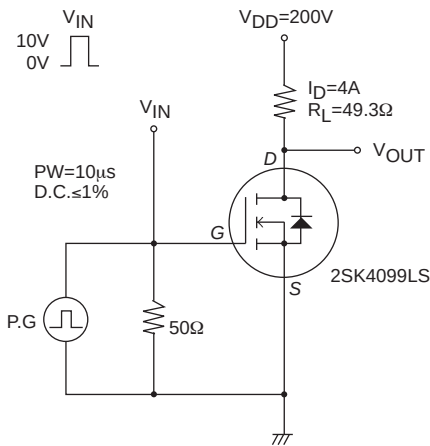
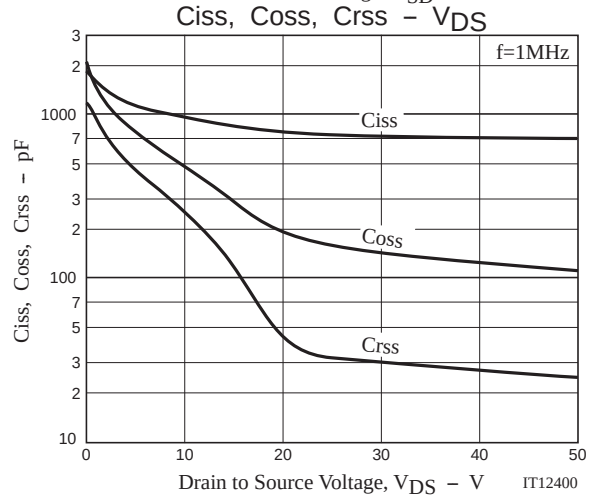
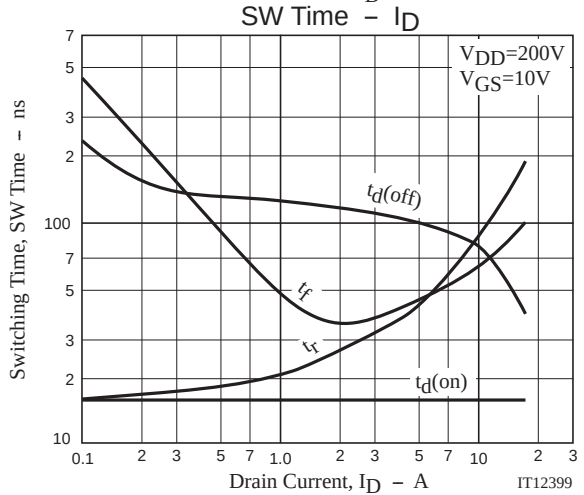
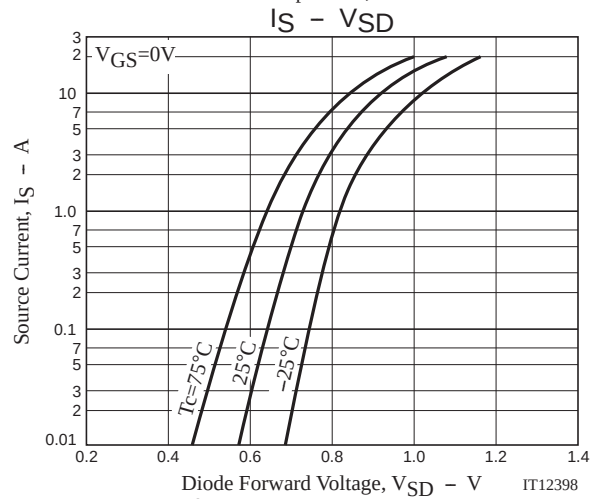
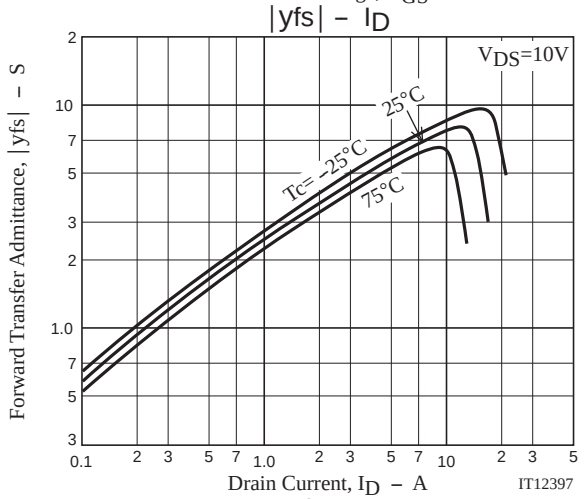
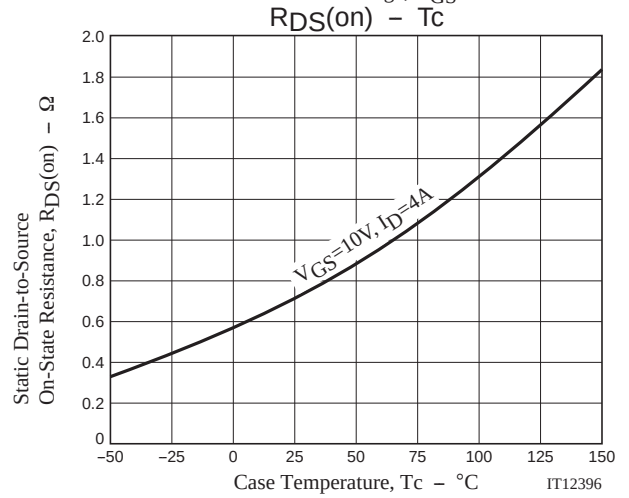
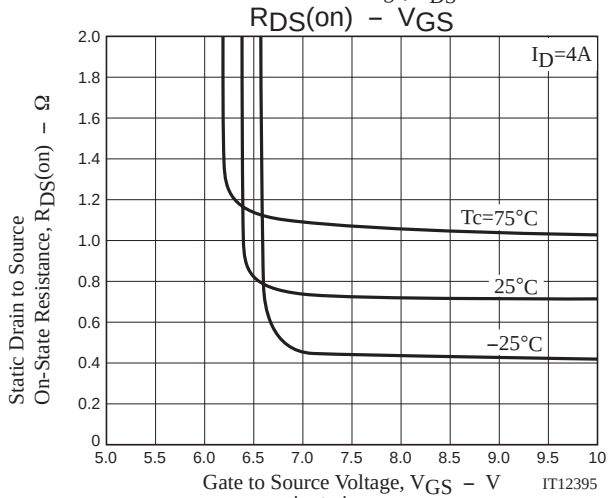
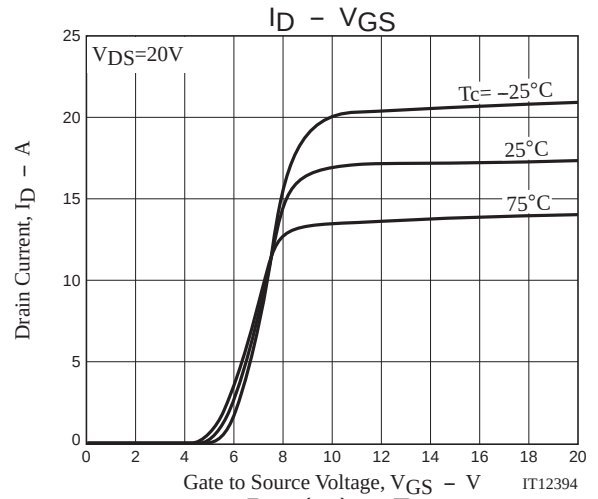
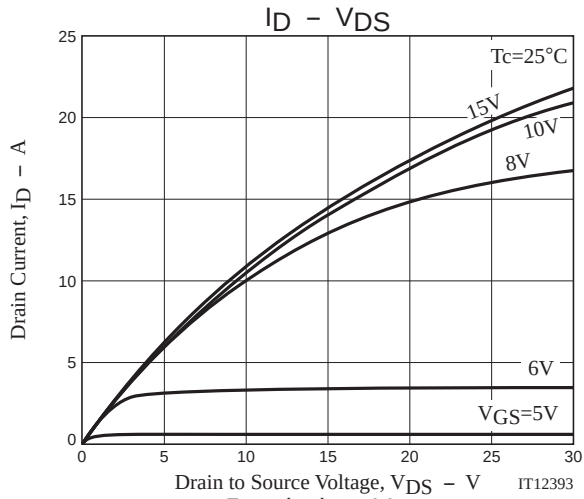
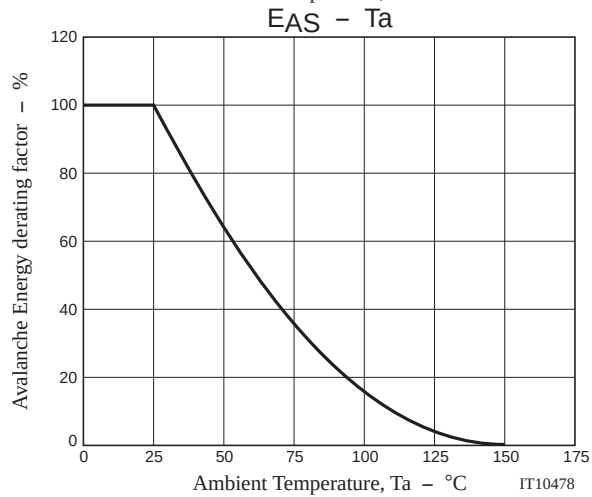
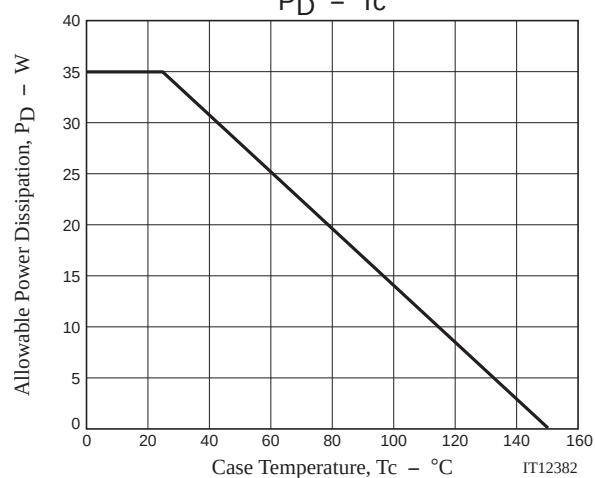
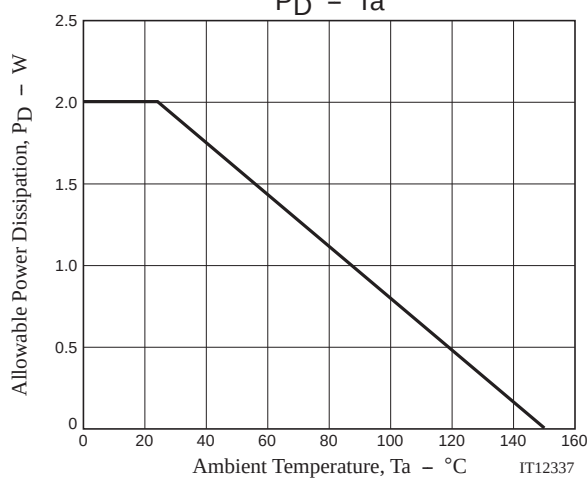
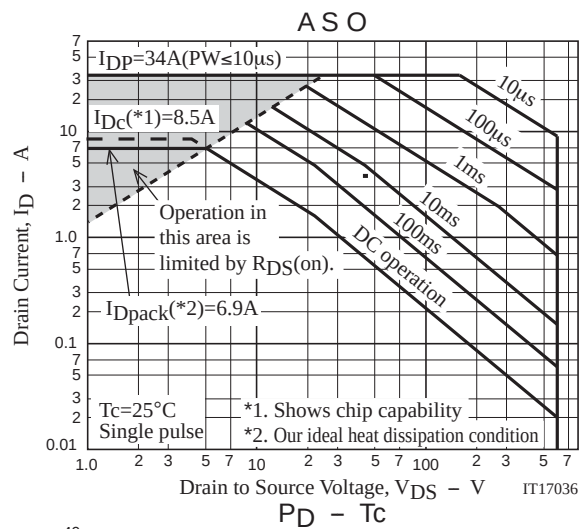
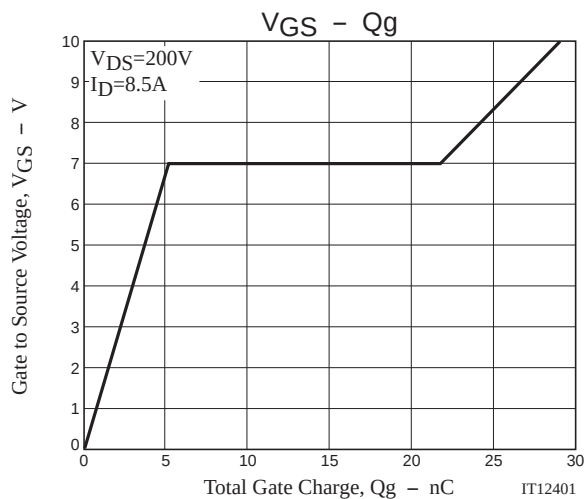


Fig.2 Switching Time Test Circuit







Magazine Specification

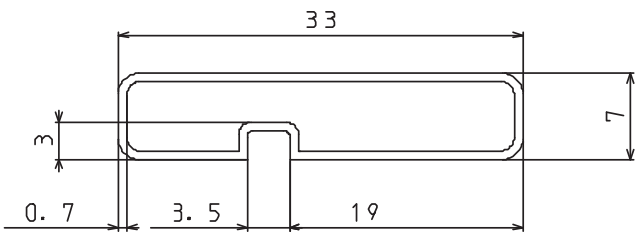
2SK4099LS-1E

1. Packing Format

Package Name	Magazine Name	Maximum Number of devices contained (pcs)			Packing format	
		Magazine	Inner box	Outer box	Inner BOX	Outer BOX
TO-220F-3FS	TO-220F	50	1,000	4,000	SPD-0V0001 20 magazines contained Dimensions:mm {external} 568×150×55	SPT-081029 4 inner boxes contained Dimensions:mm {external} 590×225×178

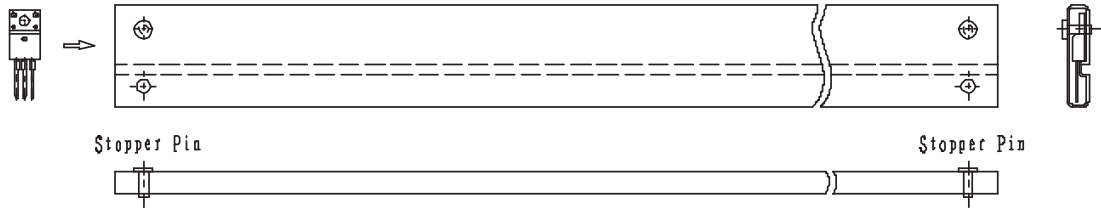
2. Magazine dimensions

(unit:mm)

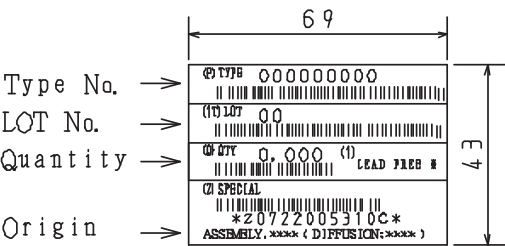


Tolerance=±0.3mm
Thickness=0.7±0.2mm
Length =532.5±2mm
Material =PVC (Antistatic treatment)

3. Storage method to magazine

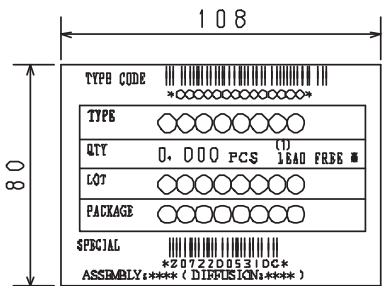


4. Inner box label (unit:mm)



5. Outer box label (unit:mm)

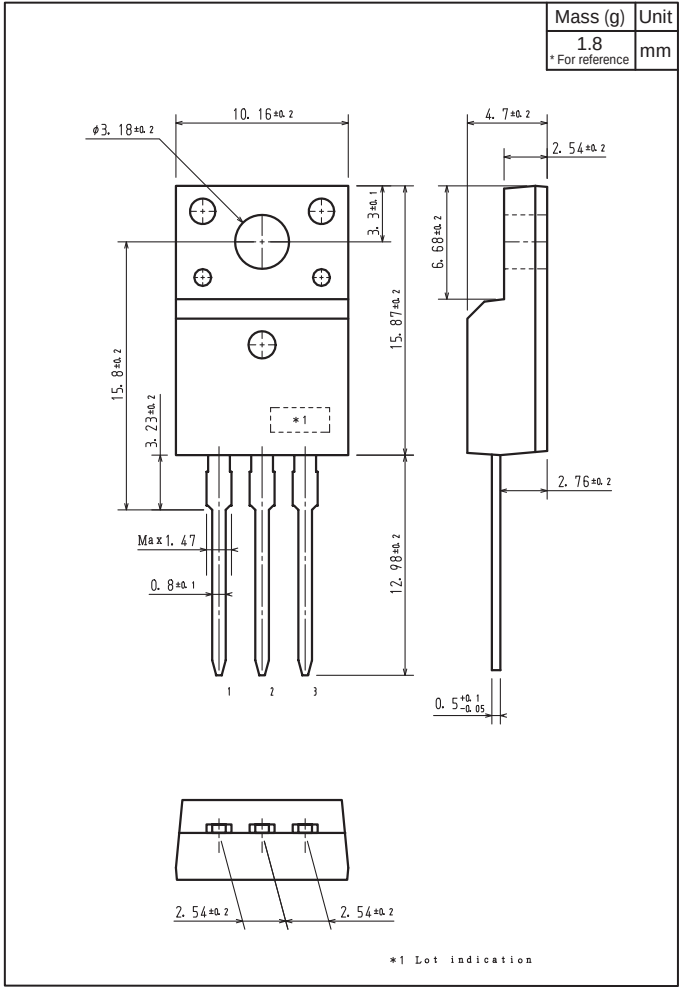
It is a label at the time of factory shipments.
The form of a label may change in physical
distribution process.



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

Outline Drawing
2SK4099LS-1E



Note on usage : Since the 2SK4099LS is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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