Ordering number : ENA1370C

2SK4198FS

N-Channel Power MOSFET
600V, 5A, 2.34Ω, TO-220F-3FS

ON Semiconductor®

http://onsemi.com

Features

- ON-resistance $R_{DS}(on)$=1.8Ω (typ.)
- 10V drive
- Input capacitance Ciss=360pF (typ.)
- Repetitive avalanche guarantee

Specifications

Absolute Maximum Ratings at Ta=25°C

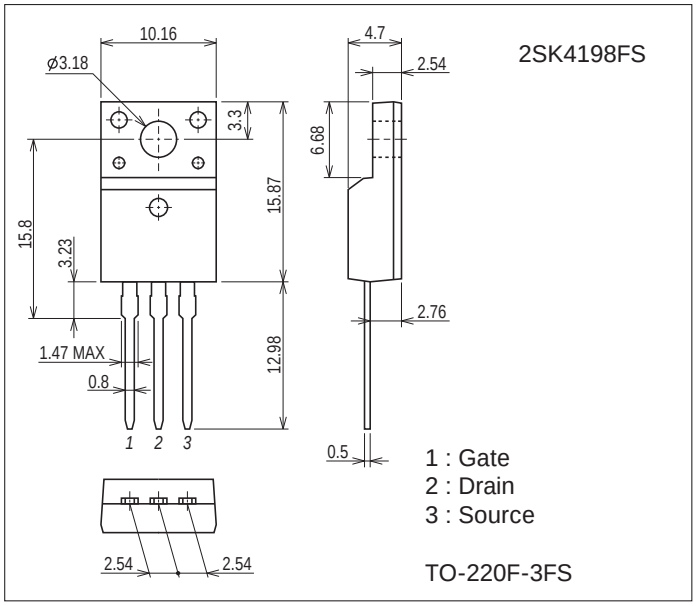
Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		600	V
Gate-to-Source Voltage	V_{GSS}		±30	V
Drain Current (DC)	I_{Dc} *1	Limited only by maximum temperature Tch=150°C	5	A
	I_{Dpack} *2	Tc=25°C (Our ideal heat dissipation condition)*3	4	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	18	A
Allowable Power Dissipation	P_D		2.0	W
		Tc=25°C (Our ideal heat dissipation condition)*3	30	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *4	E_{AS}		55	mJ
Avalanche Current *5	I_{AV}		4.5	A
Avalanche Energy (Repetition)	E_{AR}	Limited only by maximum temperature Tch=150°C	3	mJ

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}=50V, L=5mH, I_{AV}=4.5A (Fig.1)
*5 L≤5mH, 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

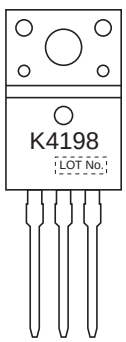
unit : mm (typ)
7528-001



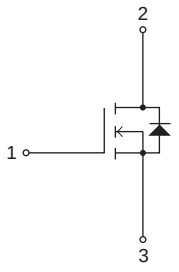
Product & Package Information

- Package : TO-220F-3FS
- JEITA, JEDEC : SC-67
- Minimum Packing Quantity : 50 pcs./magazine

Marking



Electrical Connection



Semiconductor Components Industries, LLC, 2013

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}=±30V, V_{DS}=0V			±100	nA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	3		5	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=2.5A	1.2	2.4		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)	I_D=2.5A, V_{GS}=10V		1.8	2.34	Ω
Input Capacitance	Ciss	V_{DS}=30V, f=1MHz		360		pF
Output Capacitance	Coss			69		pF
Reverse Transfer Capacitance	Crss			15		pF
Turn-ON Delay Time	t_d(on)	See Fig.2		13		ns
Rise Time	t_r			28		ns
Turn-OFF Delay Time	t_d(off)			39		ns
Fall Time	t_f			15		ns
Total Gate Charge	Qg	V_{DS}=200V, V_{GS}=10V, I_D=5A		14.3		nC
Gate-to-Source Charge	Qgs			3.0		nC
Gate-to-Drain “Miller” Charge	Qgd			8.2		nC
Diode Forward Voltage	V_{SD}	I_S=5A, V_{GS}=0V		0.9	1.2	V

Fig.1 Unclamped Inductive Switching Test Circuit

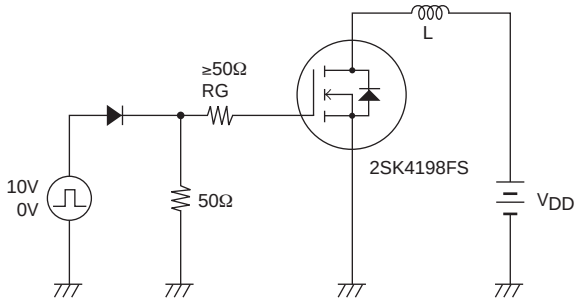
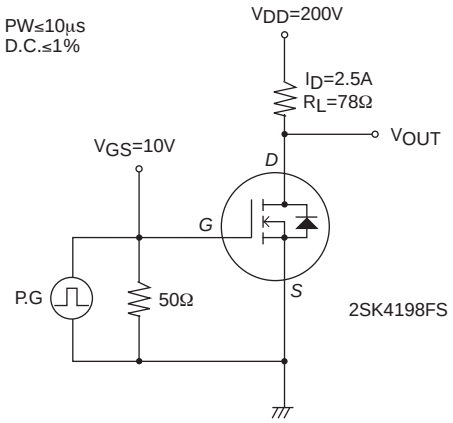
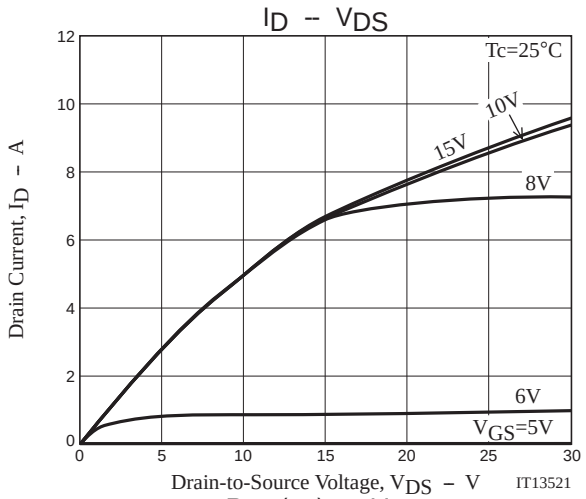


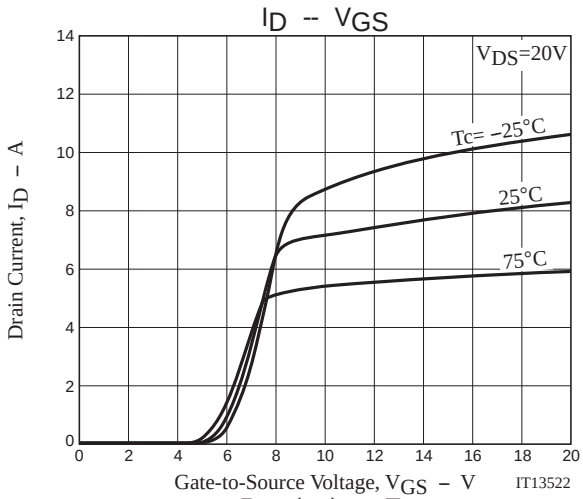
Fig.2 Switching Time Test Circuit

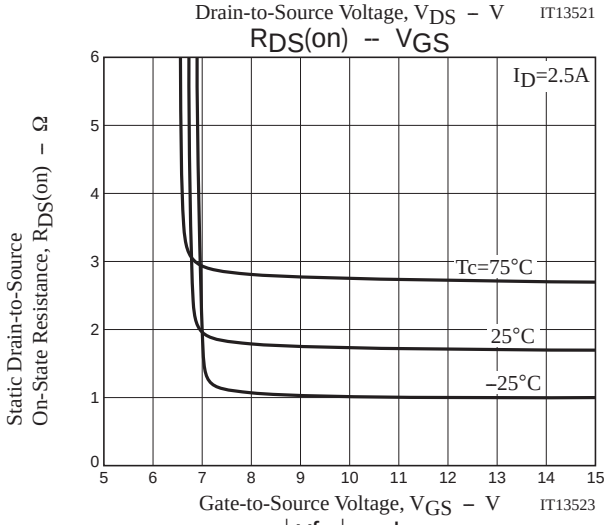


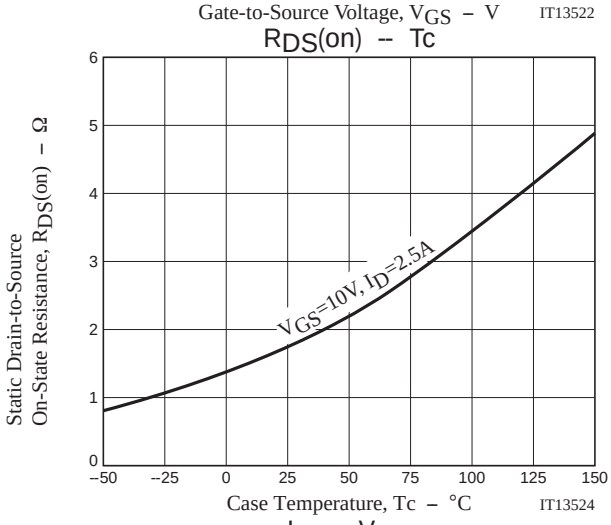
Ordering Information

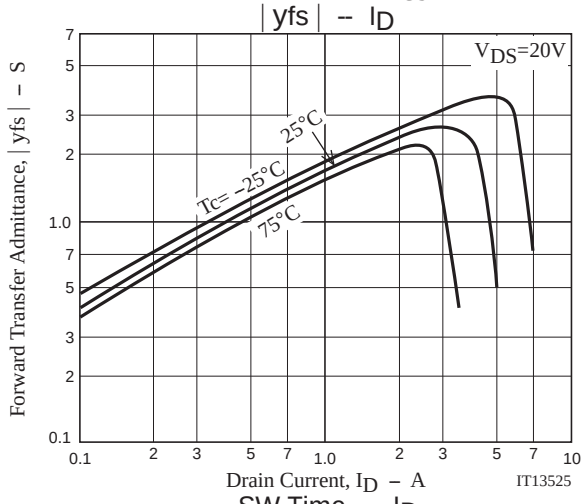
Device	Package	Shipping	memo
2SK4198FS	TO-220F-3FS	50pcs./magazine	Pb Free

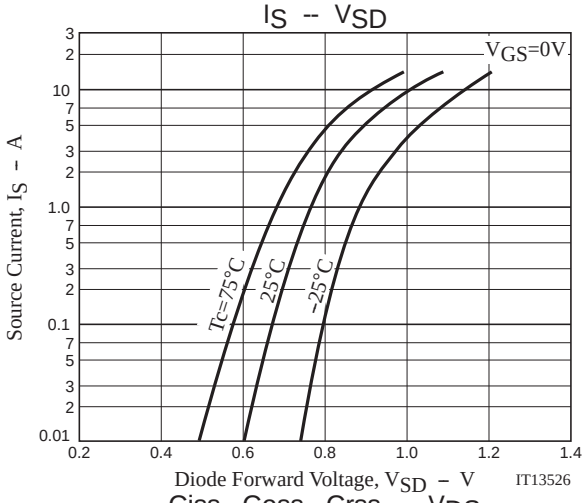

ID -- VDS
Tc=25°C
10V
15V
8V
6V
VGS=5V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT13521

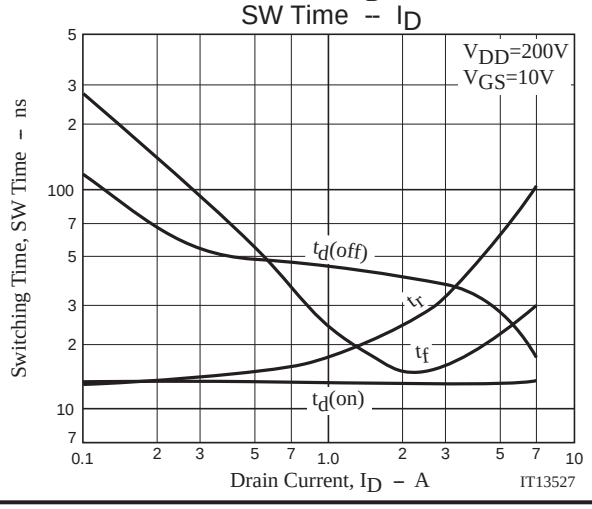

ID -- VGS
VDS=20V
Tc= –25°C
25°C
75°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT13522

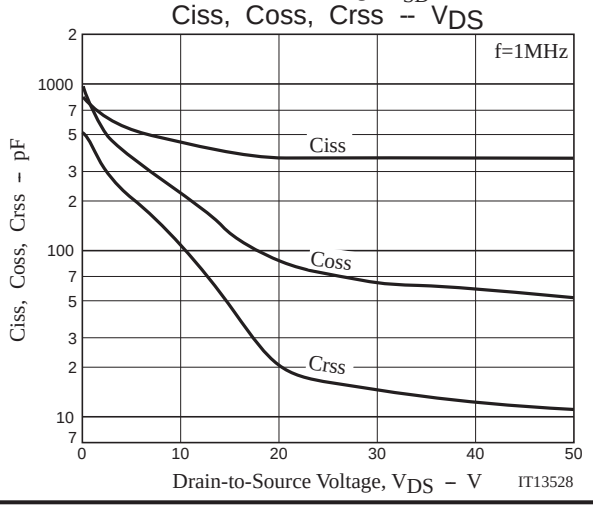

RDS(on) -- VGS
ID=2.5A
Tc=75°C
25°C
–25°C
Static Drain-to-Source
On-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V
IT13523

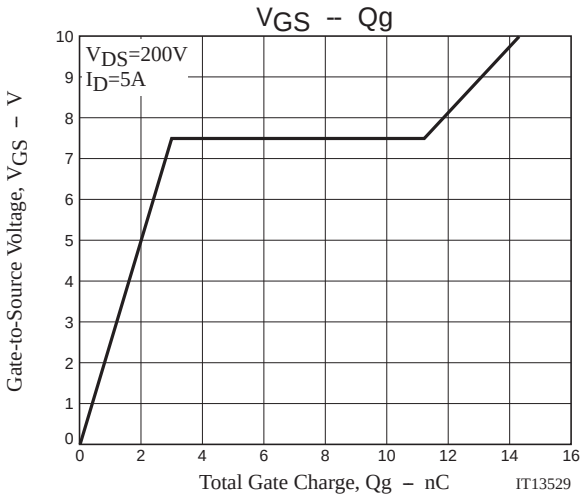

RDS(on) -- Tc
VGS=10V, ID=2.5A
Static Drain-to-Source
On-State Resistance, RDS(on) – Ω
Case Temperature, Tc – °C
IT13524

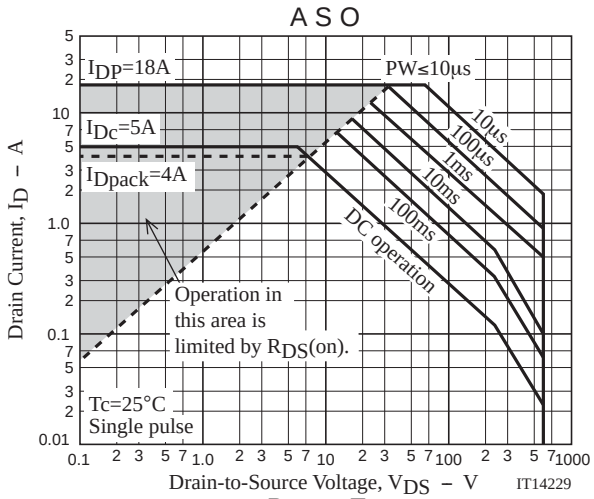

| yfs | -- ID
VDS=20V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT13525

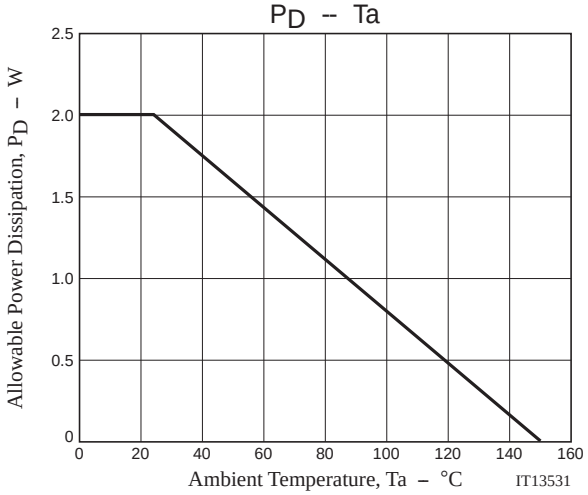

IS -- VSD
VGS=0V
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT13526

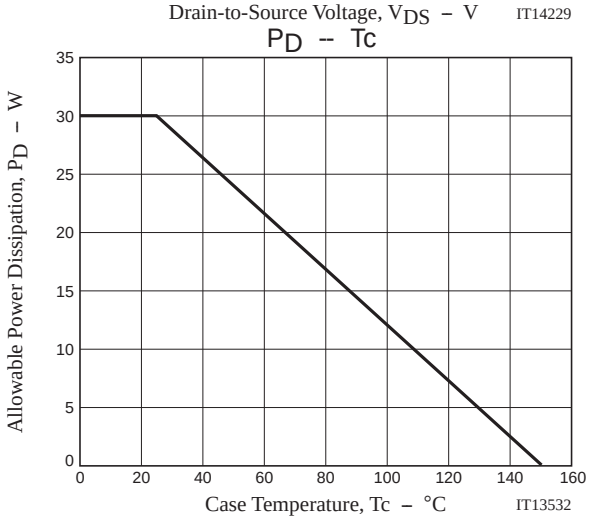

SW Time -- ID
VDD=200V
VGS=10V
td(off)
tr
tf
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT13527

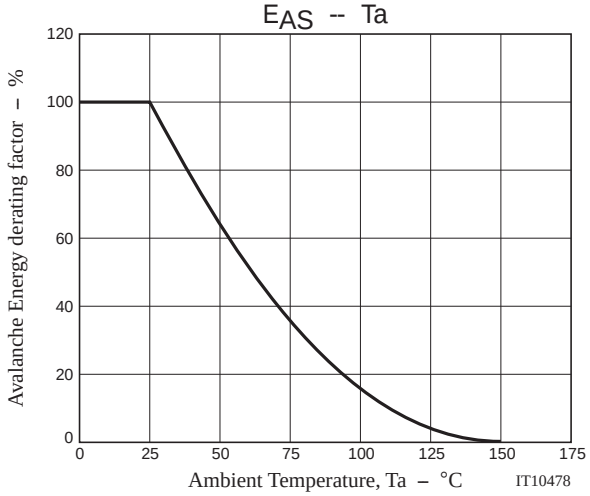

Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT13528


VGS – Qg
VDS=200V
ID=5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT13529


A S O
IDP=18A
PW≤10μs
IDC=5A
IDpack=4A
10μs
100μs
1ms
10ms
100ms
DC operation
Operation in this area is limited by RDS(on).
Tc=25°C
Single pulse
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT14229


PD -- Ta
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT13531


PD -- Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
IT13532


EAS -- Ta
Avalanche Energy derating factor – %
Ambient Temperature, Ta – °C
IT10478

Magazine Specification

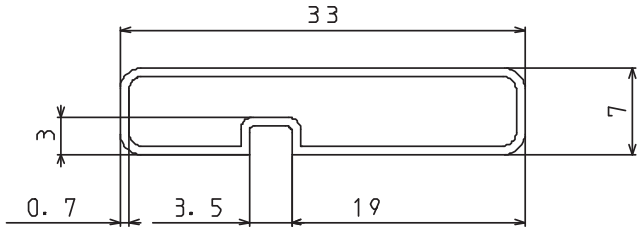
2SK4198FS

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

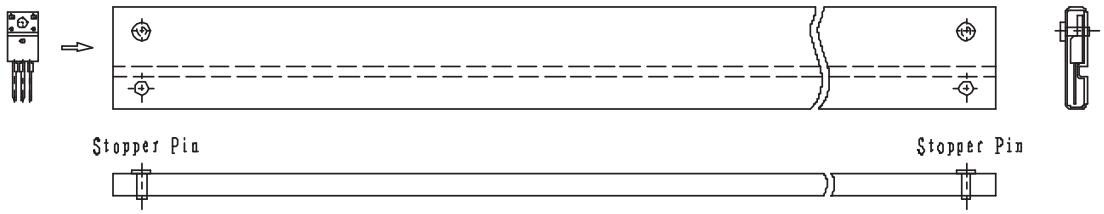
2. Magazine dimensions

(unit:mm)

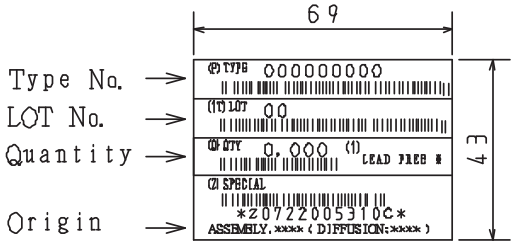


Tolerance=±0.3mm
Thickness=0.7±0.2mm
Length =532.5±2mm
Material =PVC (Antistatic treatment)

3. Storage method to magazine

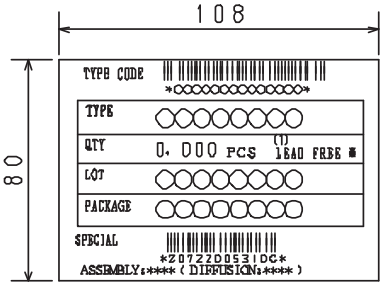


4. Inner box label (unit:mm)



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.

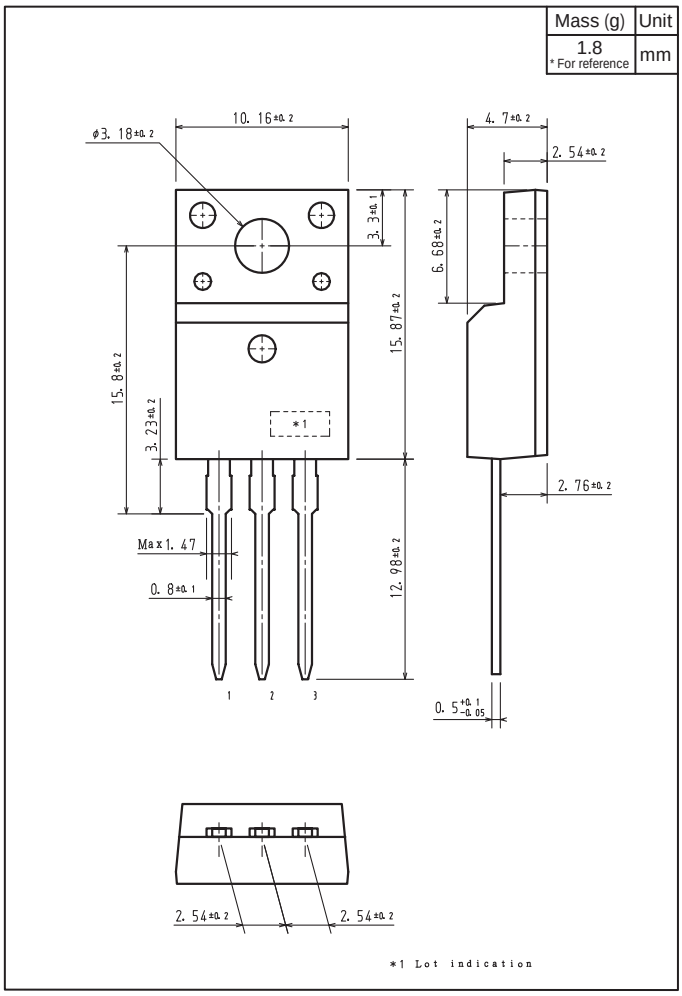


NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A

Outline Drawing

2SK4198FS



Note on usage : Since the 2SK4198FS is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

ON Semiconductor and the ON logo are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of SCILLC's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.