Ordering number : ENA0747B

2SK4125

N-Channel Power MOSFET
600V, 17A, 610mΩ, TO-3P-3L

ON Semiconductor®
http://onsemi.com

Features

- ON-resistance $R_{DS}(on)$=0.47Ω (typ.)
- Input capacitance Ciss=1200pF (typ.)
- 10V drive

Specifications

Absolute Maximum Ratings at Ta=25°C

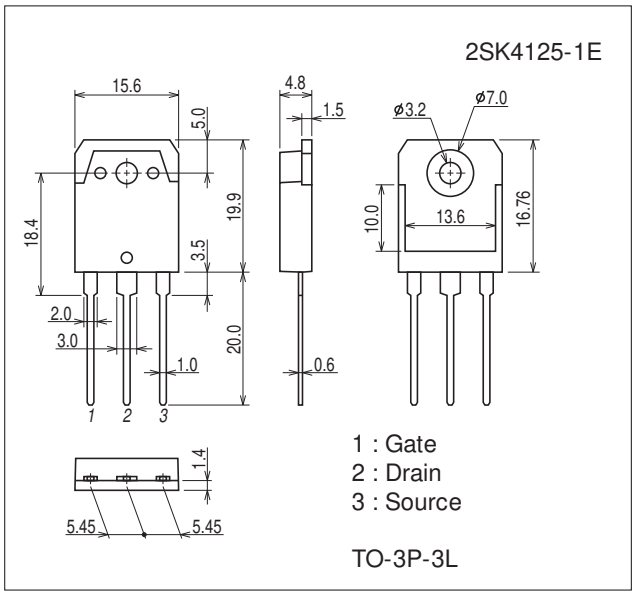
Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		600	V
Gate-to-Source Voltage	V_{GSS}		±30	V
Drain Current (DC)	I_D		17	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	52	A
Allowable Power Dissipation	P_D		2.5	W
		Tc=25°C (Our ideal heat dissipation condition)*1	170	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *2	E_{AS}		78.8	mJ
Avalanche Current *3	I_{AV}		17	A

*1 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.
*2 V_{DD}=50V, L=500μH, I_{AV}=17A (Fig.1)
*3 L≤500μH, 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

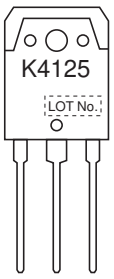
unit : mm (typ)
7539-002



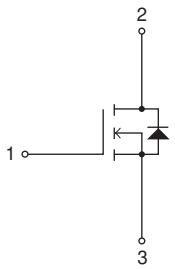
Product & Package Information

- Package : TO-3P-3L
- JEITA, JEDEC : SC-65, TO-247, SOT-199
- Minimum Packing Quantity : 30 pcs./magazine

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=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=8.5A	4.5	9		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)	I_D=7A, V_{GS}=10V		0.47	0.61	Ω
Input Capacitance	Ciss	V_{DS}=30V, f=1MHz		1200		pF
Output Capacitance	Coss			220		pF
Reverse Transfer Capacitance	Crss			50		pF
Turn-ON Delay Time	t_d(on)	See Fig.2		26.5		ns
Rise Time	t_r			82		ns
Turn-OFF Delay Time	t_d(off)			145		ns
Fall Time	t_f			52		ns
Total Gate Charge	Qg	V_{DS}=200V, V_{GS}=10V, I_D=17A		46		nC
Gate-to-Source Charge	Qgs			8.3		nC
Gate-to-Drain "Miller" Charge	Qgd			26.7		nC
Diode Forward Voltage	V_{SD}	I_S=17A, V_{GS}=0V		1.0	1.3	V

Fig.1 Avalanche Resistance Test Circuit

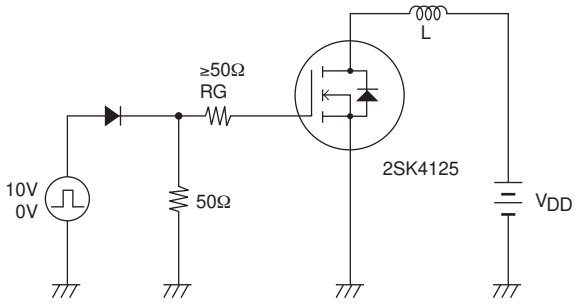
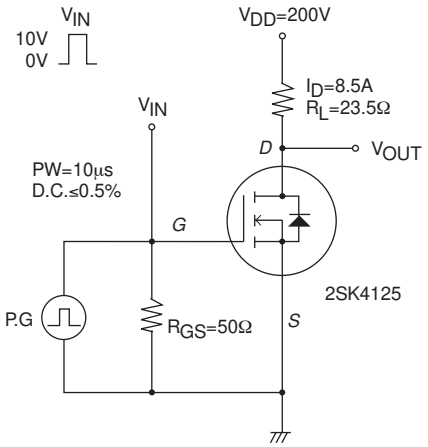
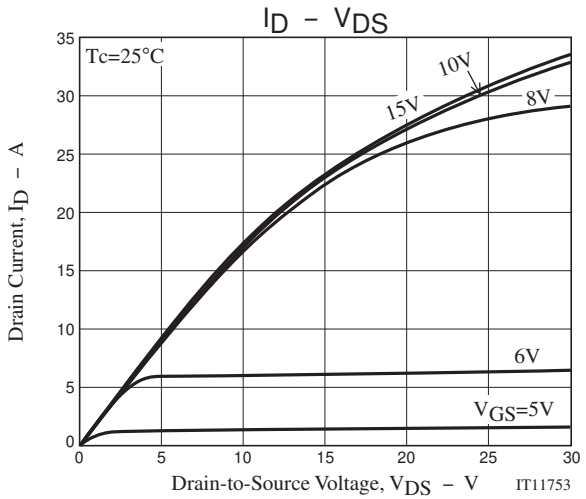


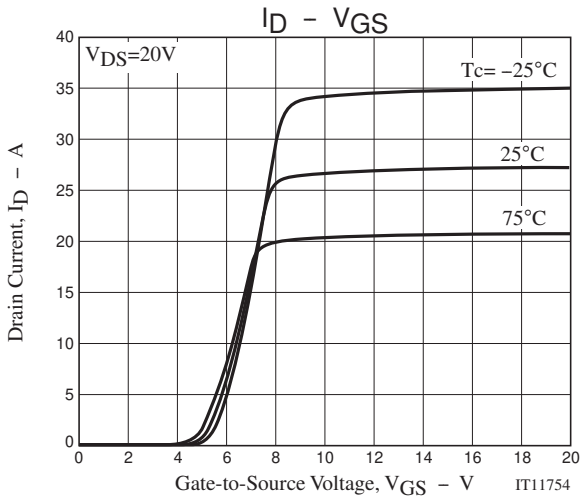
Fig.2 Switching Time Test Circuit

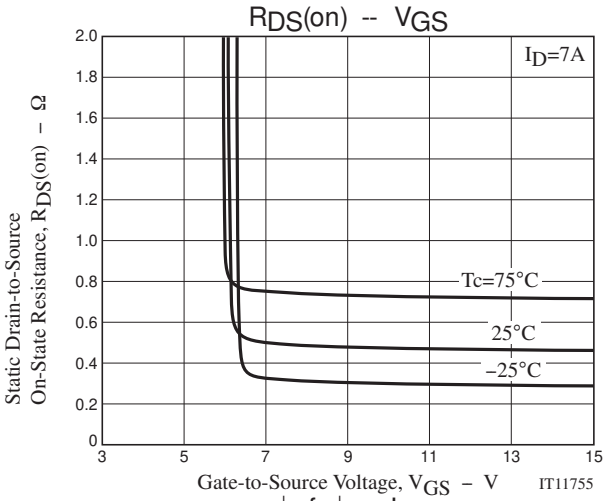


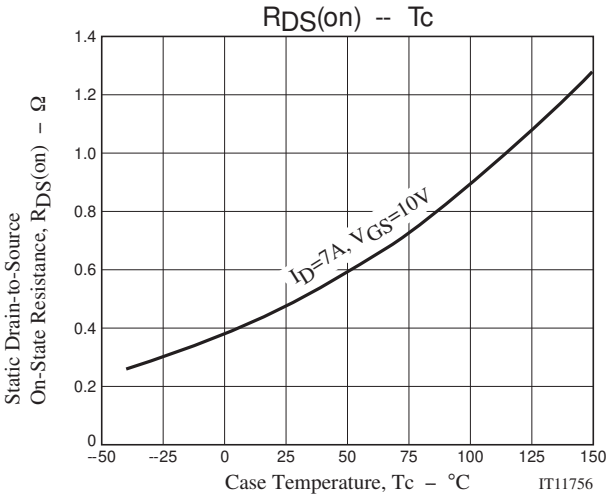
Ordering Information

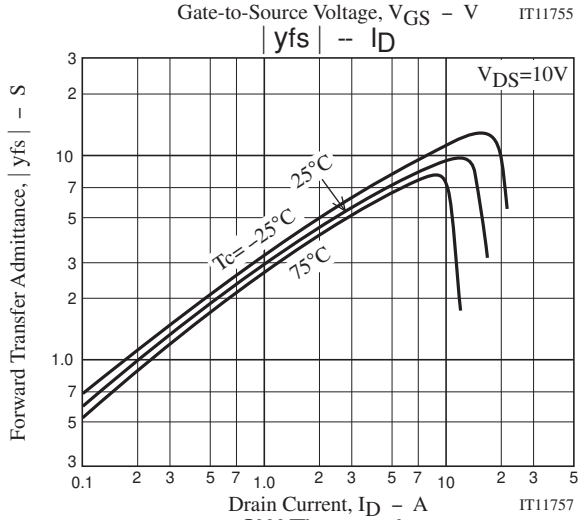
Device	Package	Shipping	memo
2SK4125-1E	TO-3P-3L	30pcs./magazine	Pb Free

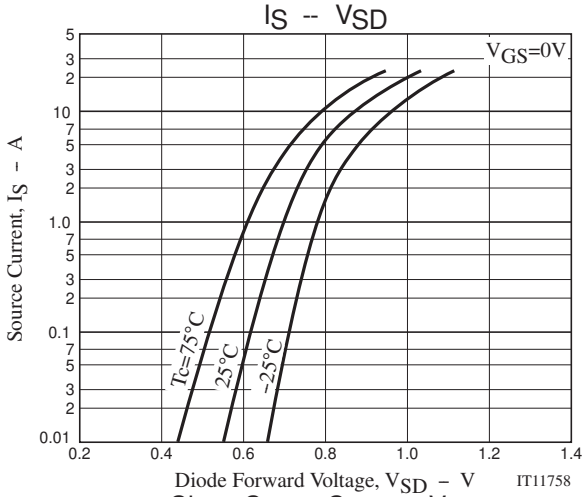


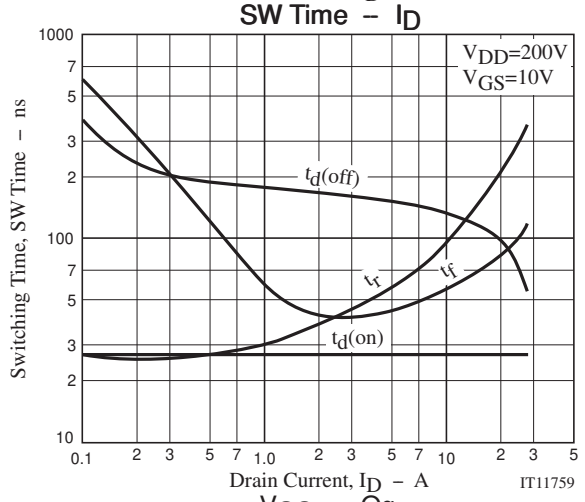


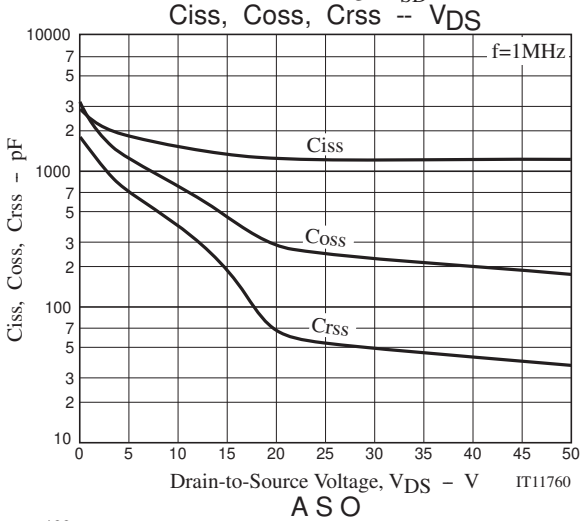

RDS(on) -- VGS
ID=7A
Tc=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V
IT11755

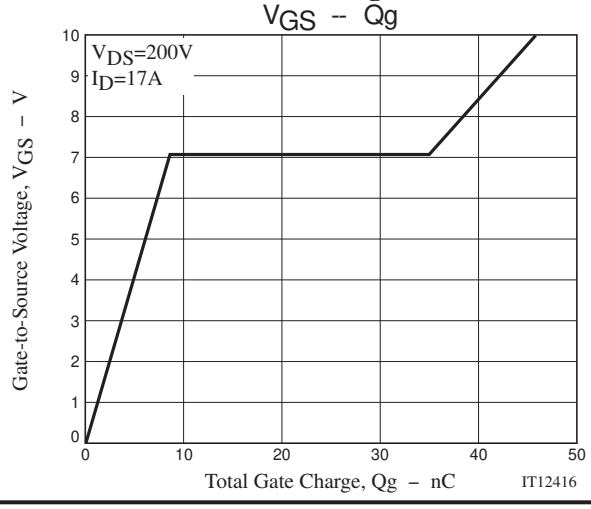

RDS(on) -- Tc
ID=7A, VGS=10V
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Case Temperature, Tc – °C
IT11756

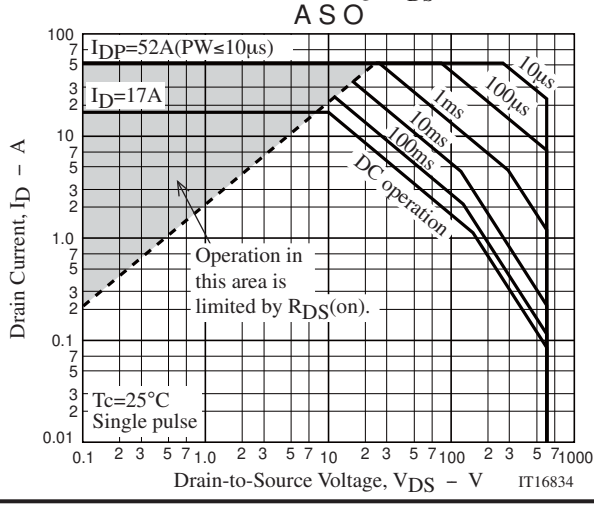

| yfs | -- ID
VDS=10V
25°C
Tc=–25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT11757

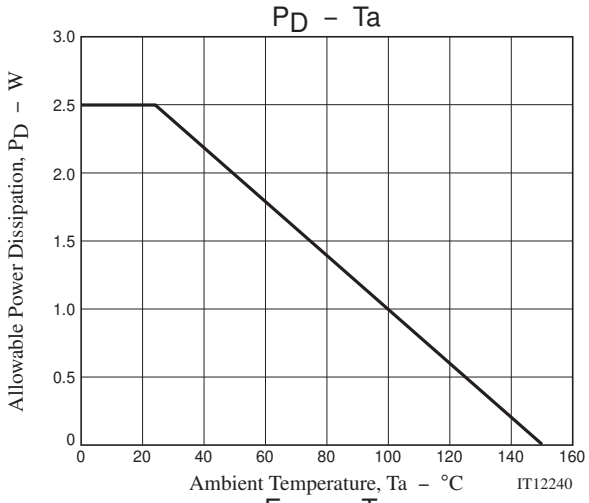

IS -- VSD
VGS=0V
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT11758

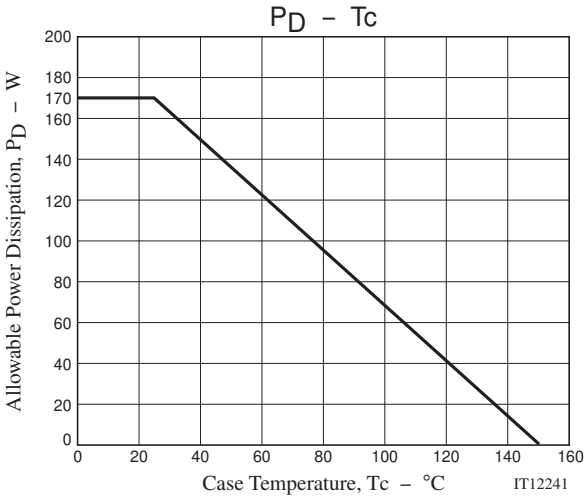

SW Time -- ID
VDD=200V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT11759

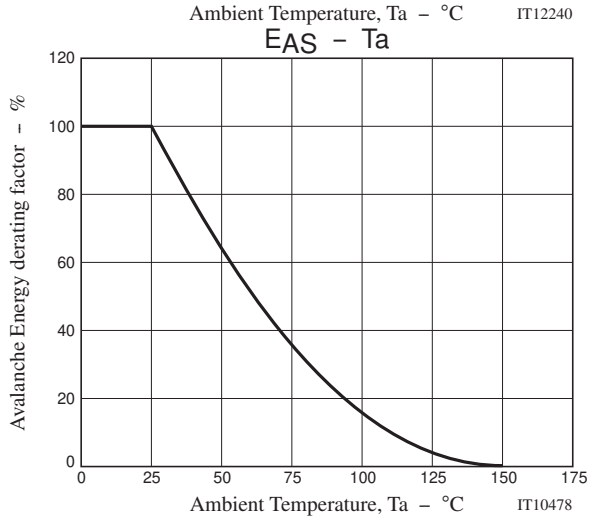

Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT11760


VGS -- Qg
VDS=200V
ID=17A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT12416


ASO
IDP=52A(PW≤10μs)
ID=17A
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
IT16834


PD – Ta
Allowable Power Dissipation, PD – W
3.0
2.5
2.0
1.5
1.0
0.5
0
0 20 40 60 80 100 120 140 160
Ambient Temperature, Ta – °C
IT12240


PD – Tc
Allowable Power Dissipation, PD – W
200
180
170
160
140
120
100
80
60
40
20
0
0 20 40 60 80 100 120 140 160
Case Temperature, Tc – °C
IT12241


EAS – Ta
Avalanche Energy derating factor – %
120
100
80
60
40
20
0
0 25 50 75 100 125 150 175
Ambient Temperature, Ta – °C
IT10478

Magazine Specification

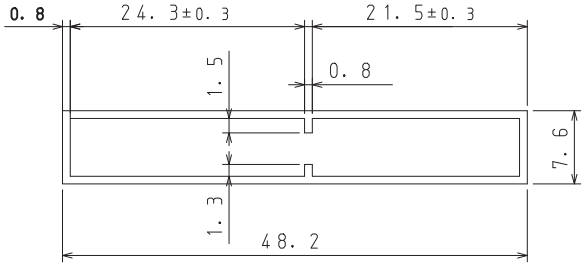
2SK4125-1E

1. Packing Format

Package Name	Maximum Number of devices contained (pcs)			Packing format	
	Magazine	Inner box	Outer box	Inner BOX	Outer BOX
TO-3P-3L	30	450	1800	SPD-0V0001 15 magazines contained Dimensions:mm(external) 568×150×55	SPD-LV0010 4 inner boxes contained Dimensions:mm(external) 590x225x178

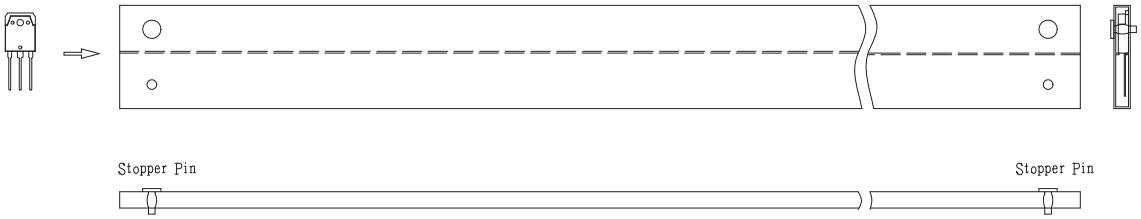
2. Magazine dimensions

(unit:mm)

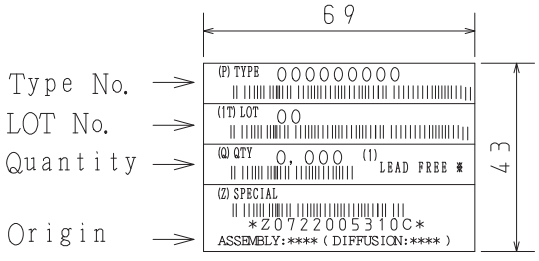


Tolerance=±0.2mm
Thickness=0.8±0.2mm
Length =508.0±1mm
Material =PVC or PET
(Antistatic treatment)

3. Storage method to magazine

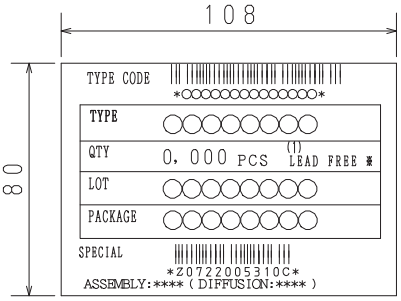


4. Inner box label (unit:mm)



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.

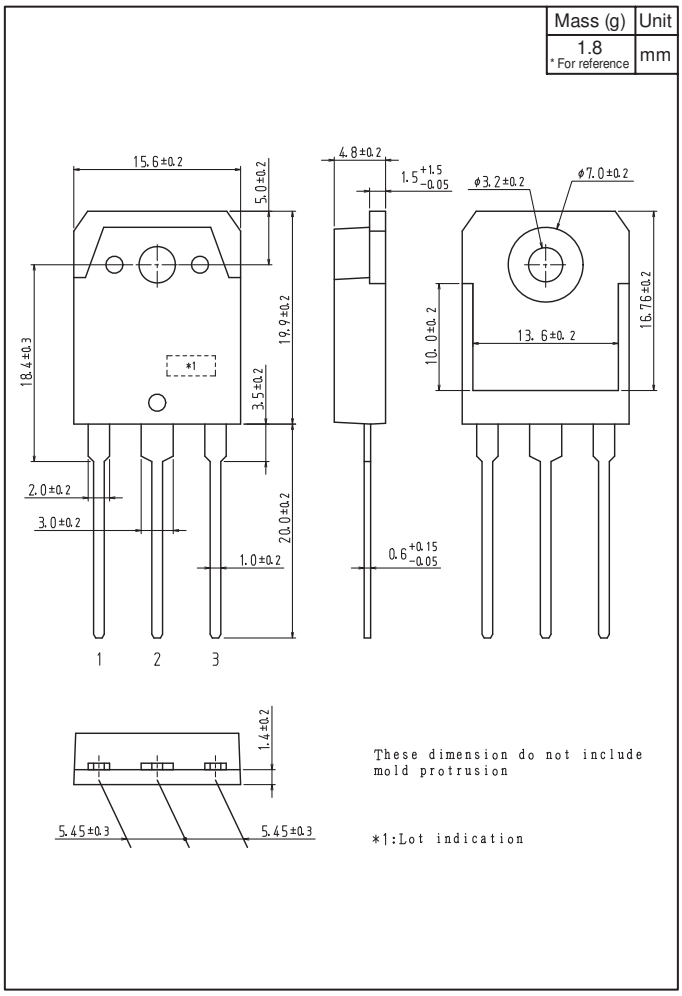


NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A

Outline Drawing

2SK4125-1E



Note on usage : Since the 2SK4125 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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