Ordering number : EN8635A

2SK3745LS

N-Channel Power MOSFET
1500V, 2A, 13Ω, TO-220F-3FS

ON Semiconductor®
http://onsemi.com

Features

- Low ON-resistance, low input capacitance, ultrahigh-speed switching
- High reliability (Adoption of HVP process)
- Micaless package facilitating mounting
- Avalanche resistance guarantee

Specifications

Absolute Maximum Ratings at Ta=25°C

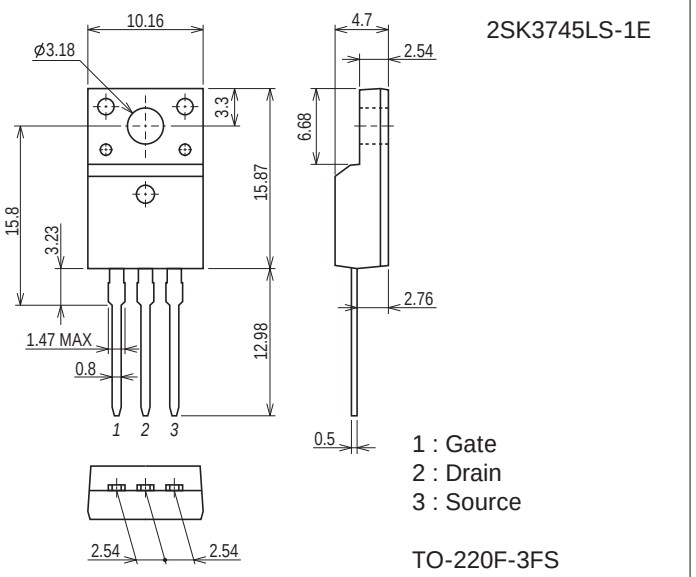
Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		1500	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D*		2	A
Drain Current (Pulse)	I_{DP}		4	A
Allowable Power Dissipation	P_D		2.0	W
		Tc=25°C	35	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *1	E_{AS}		41	mJ
Avalanche Current *2	I_{AV}		2	A

*Shows chip capability
*1 V_{DD}=50V, L=20mH, I_{AV}=2A (Fig.1)
*2 L≤20mH, 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

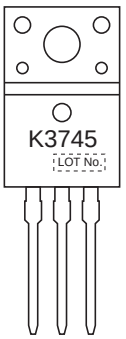
unit : mm (typ)
7528-001



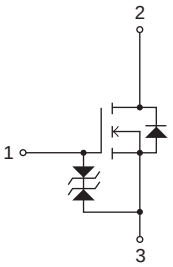
Product & Package Information

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

Marking



Electrical Connection



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	1500			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=1200V, V_{GS}=0V			100	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=16V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	2.5		3.5	V
Forward Transfer Admittance	| yfs |	V_{DS}=20V, I_D=1A	0.7	1.4		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)	I_D=1A, V_{GS}=10V		10	13	Ω
Input Capacitance	Ciss	V_{DS}=30V, f=1MHz		380		pF
Output Capacitance	Coss			70		pF
Reverse Transfer Capacitance	Crss			40		pF
Turn-ON Delay Time	t_d(on)	See Fig.2		12		ns
Rise Time	t_r			37		ns
Turn-OFF Delay Time	t_d(off)			152		ns
Fall Time	t_f			59		ns
Total Gate Charge	Qg	V_{DS}=200V, V_{GS}=10V, I_D=2A		37.5		nC
Gate-to-Source Charge	Qgs			2.7		nC
Gate-to-Drain “Miller” Charge	Qgd			20		nC
Diode Forward Voltage	V_{SD}	I_S=2A, V_{GS}=0V		0.88	1.2	V

Fig.1 Avalanche Resistance Test Circuit

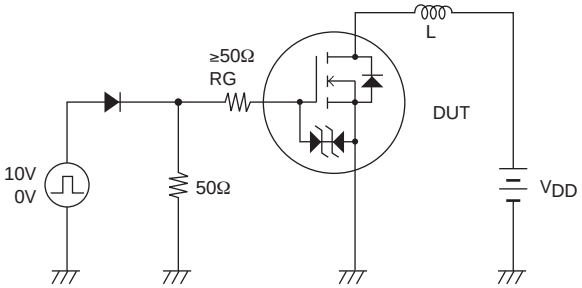
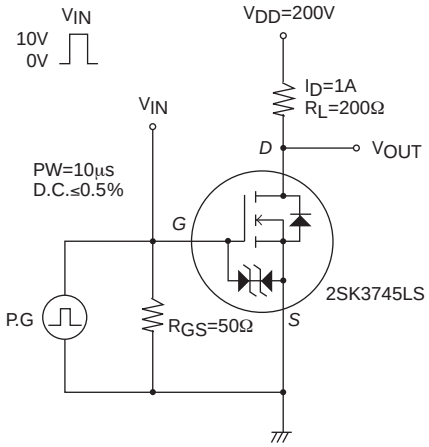
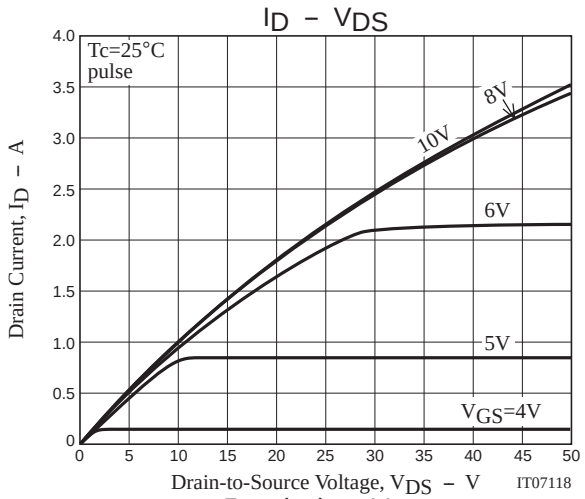


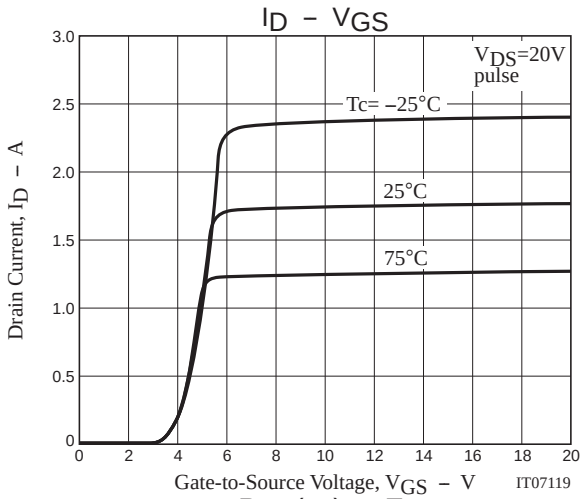
Fig.2 Switching Time Test Circuit

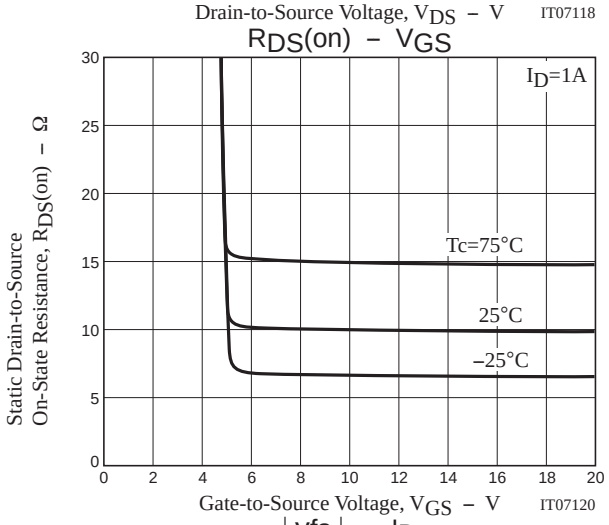


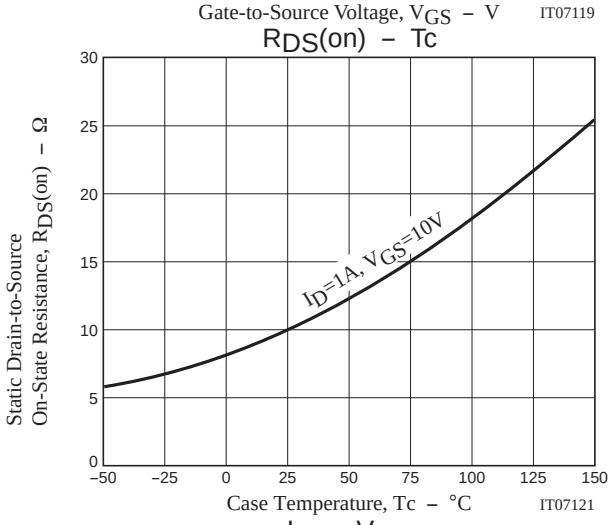
Ordering Information

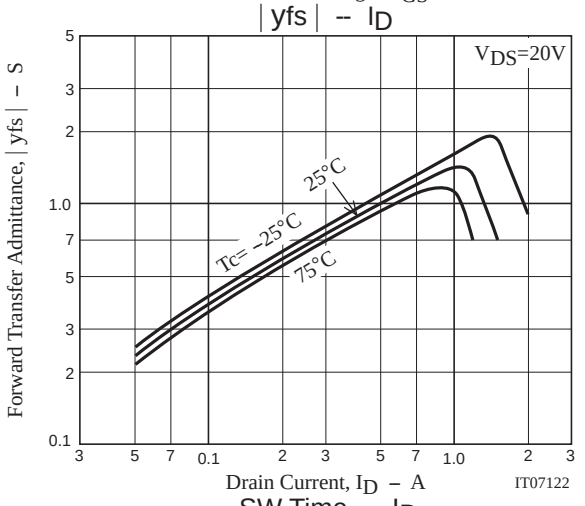
Device	Package	Shipping	memo
2SK3745LS-1E	TO-220F-3FS	50pcs./magazine	Pb Free

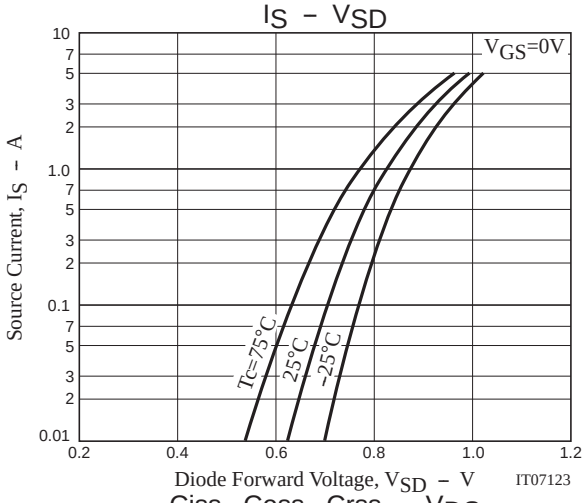

ID – VDS
Tc=25°C
pulse
8V
10V
6V
5V
VGS=4V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT07118

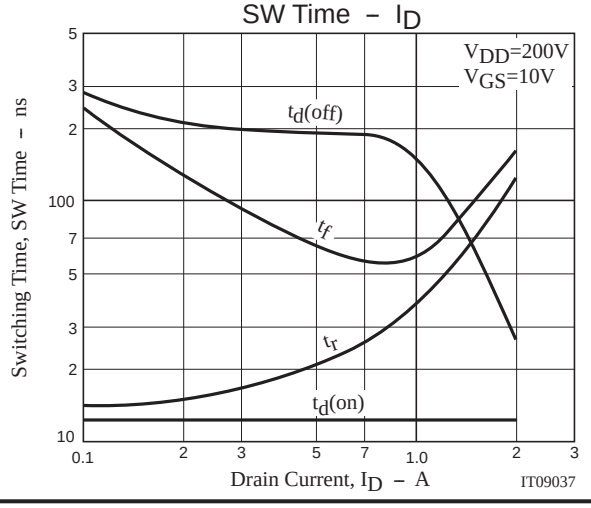

ID – VGS
VDS=20V
pulse
Tc= –25°C
25°C
75°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT07119

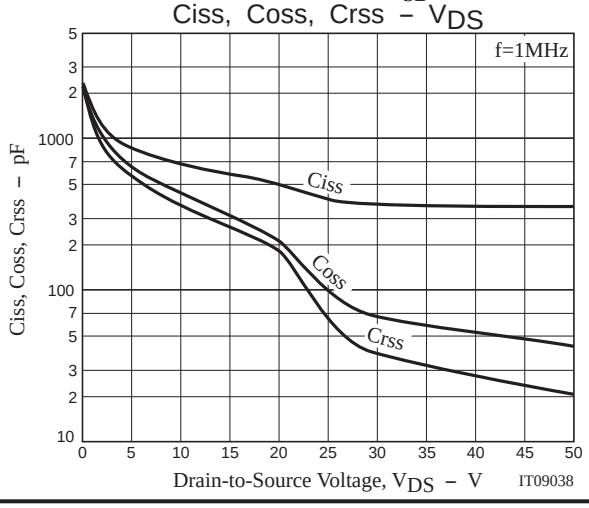

RDS(on) – VGS
ID=1A
Tc=75°C
25°C
–25°C
Static Drain-to-Source
On-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V
IT07120

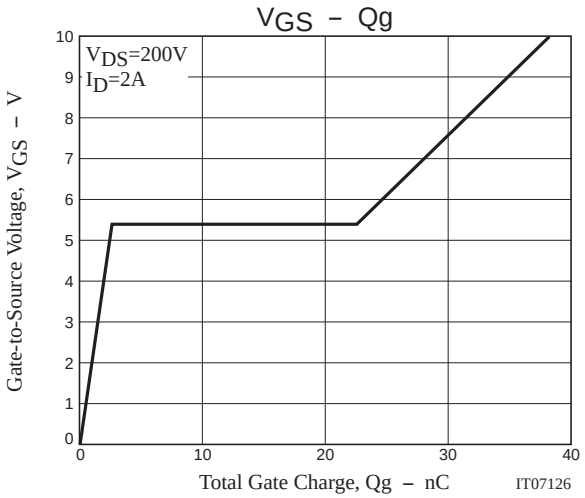

RDS(on) – Tc
ID=1A, VGS=10V
Static Drain-to-Source
On-State Resistance, RDS(on) – Ω
Case Temperature, Tc – °C
IT07121

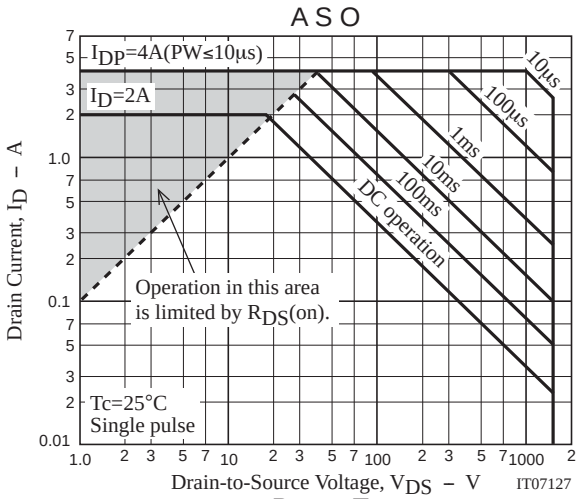

| yfs | – ID
VDS=20V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT07122

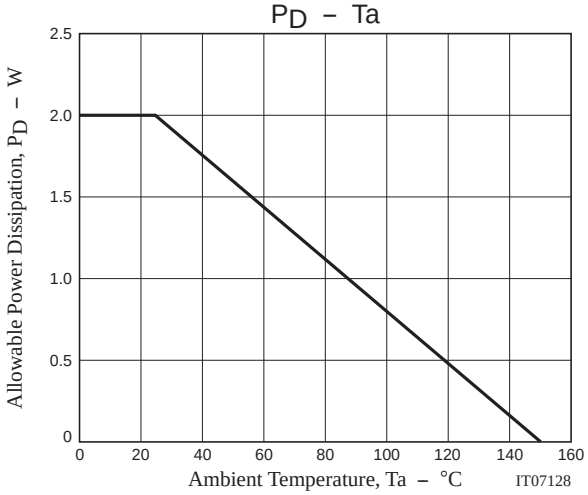

IS – VSD
VGS=0V
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT07123

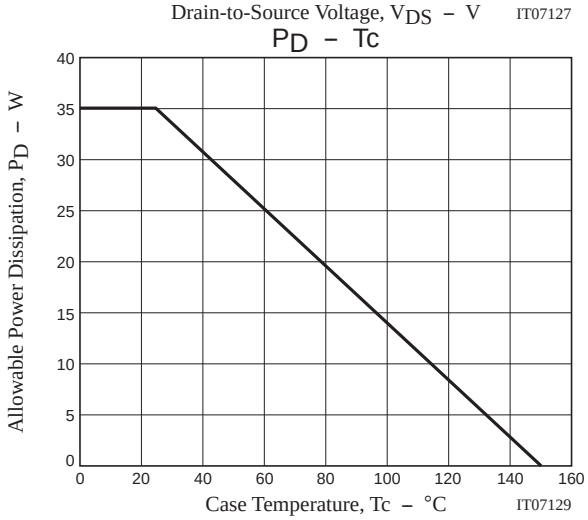

SW Time – ID
VDD=200V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT09037


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT09038


VGS – Qg
VDS=200V
ID=2A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT07126


A S O
IDP=4A(PW≤10μs)
ID=2A
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
IT07127


PD – Ta
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT07128


PD – Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
IT07129

Magazine Specification

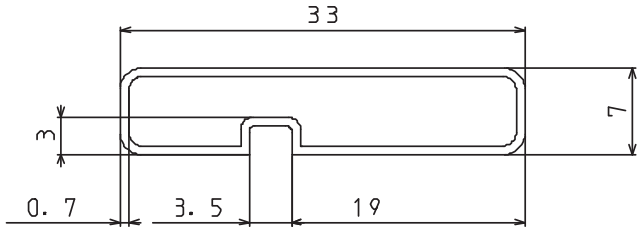
2SK3745LS-1E

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

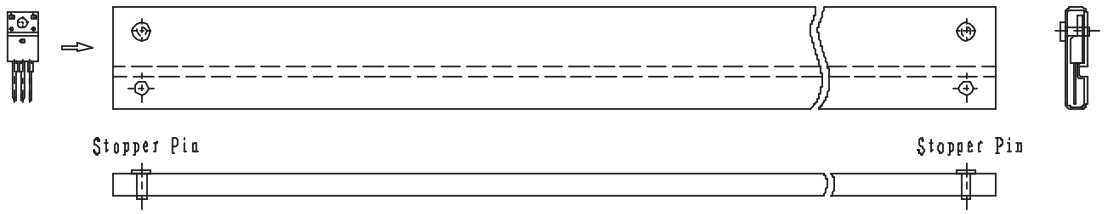
2. Magazine dimensions

(unit:mm)

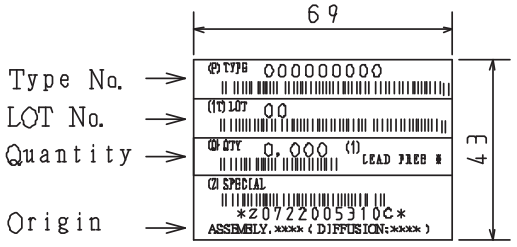


Tolerance=±0.3mm
Thickness=0.7±0.2mm
Length =532.5±2mm
Material =PVC (Antistatic treatment)

3. Storage method to magazine

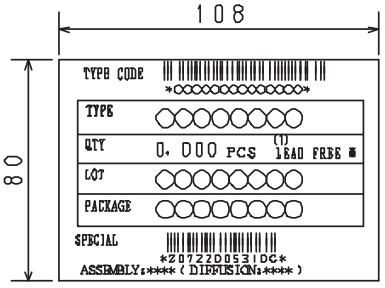


4. Inner box label (unit:mm)



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.

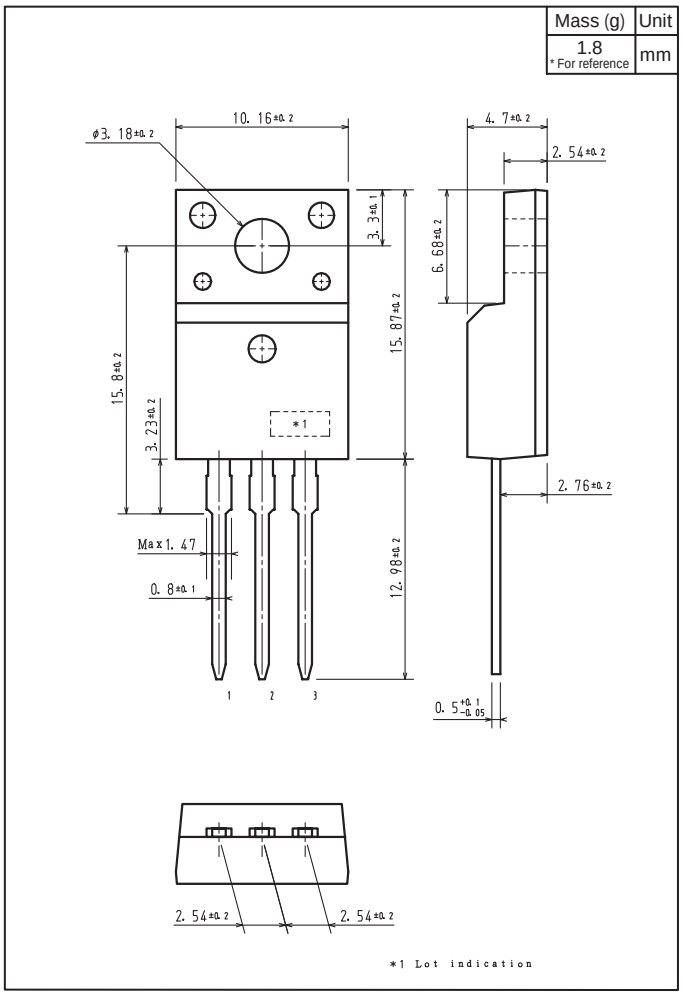


NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A

Outline Drawing

2SK3745LS-1E



Note on usage : Since the 2SK3745LS is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.