Ordering number : EN7706A

2SK3707

N-Channel Power MOSFET
100V, 20A, 60mΩ, TO-220F-3SG

ON Semiconductor®
http://onsemi.com

Features

- ON-resistance $R_{DS}(on)1$=45mΩ (typ.)
- 4V drive
- Input capacitance Ciss=2150pF (typ.)

Specifications

Absolute Maximum Ratings at Ta=25°C

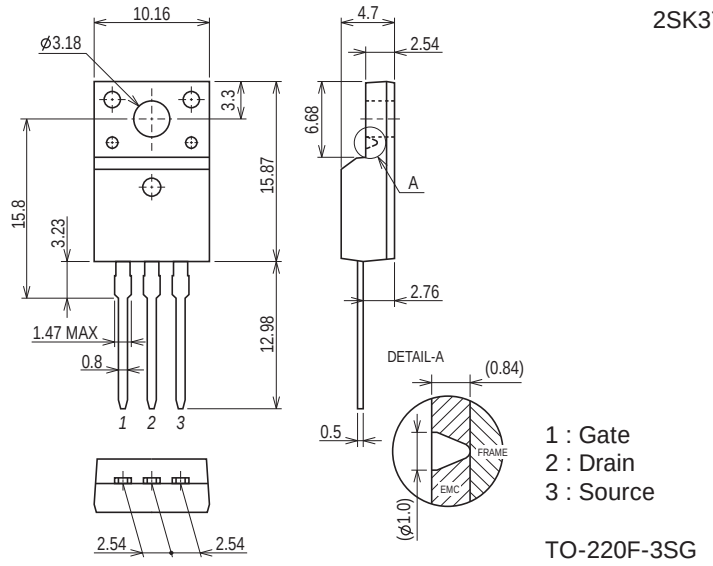
Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		100	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		20	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	80	A
Allowable Power Dissipation	P_D		2.0	W
		Tc=25°C	25	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *1	E_{AS}		125	mJ
Avalanche Current *2	I_{AV}		20	A

Note :*1 V_{DD}=20V, L=500μH, I_{AV}=20A (Fig.1)
*2 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

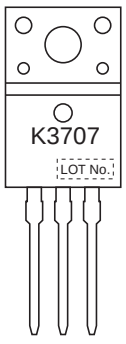
unit : mm (typ)
7529-001



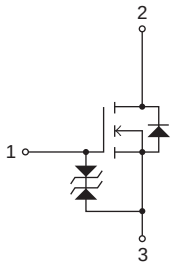
Product & Package Information

- Package : TO-220F-3SG
- 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	100			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V			1	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	1.2		2.6	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=10A	11	17		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=10A, V_{GS}=10V		45	60	mΩ
	R_{DS}(on)2	I_D=10A, V_{GS}=4V		56	80	mΩ
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		2150		pF
Output Capacitance	Coss			160		pF
Reverse Transfer Capacitance	Crss			110		pF
Turn-ON Delay Time	t_d(on)	See Fig.2		19.5		ns
Rise Time	t_r			30		ns
Turn-OFF Delay Time	t_d(off)			185		ns
Fall Time	t_f			60		ns
Total Gate Charge	Qg	V_{DS}=50V, V_{GS}=10V, I_D=20A		44		nC
Gate-to-Source Charge	Qgs			7.8		nC
Gate-to-Drain “Miller” Charge	Qgd			9.8		nC
Diode Forward Voltage	V_{SD}	I_S=20A, V_{GS}=0V		0.95	1.2	V

Fig.1 Avalanche Resistance Test Circuit

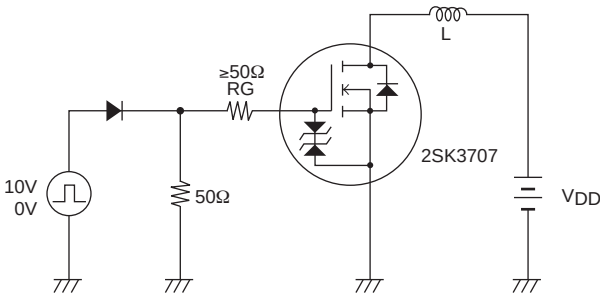
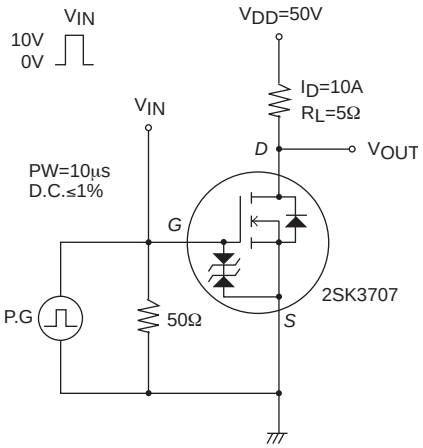
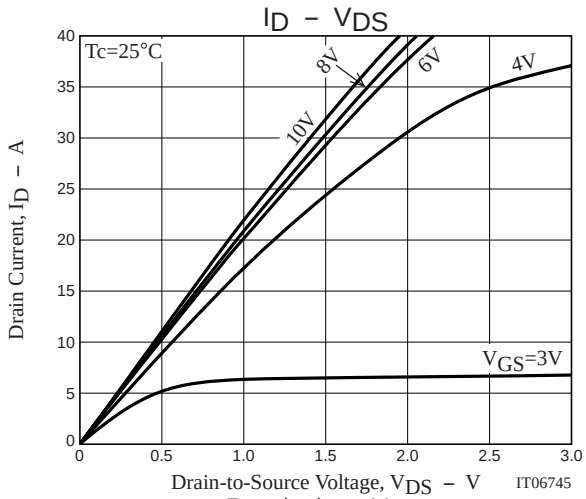


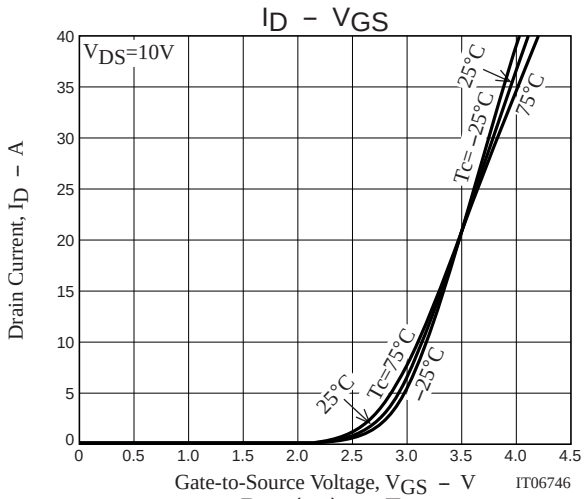
Fig.2 Switching Time Test Circuit

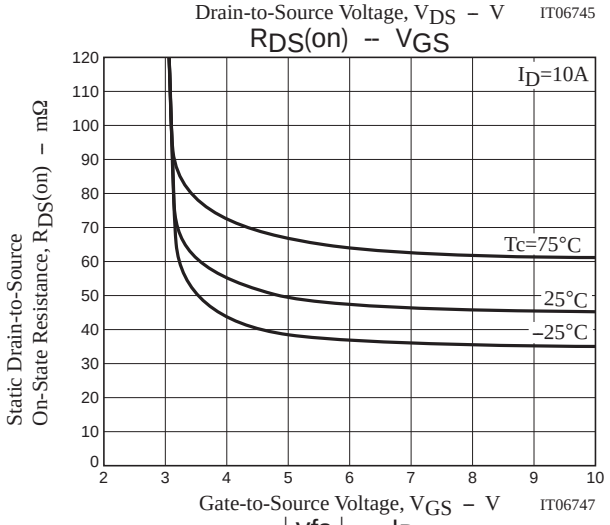


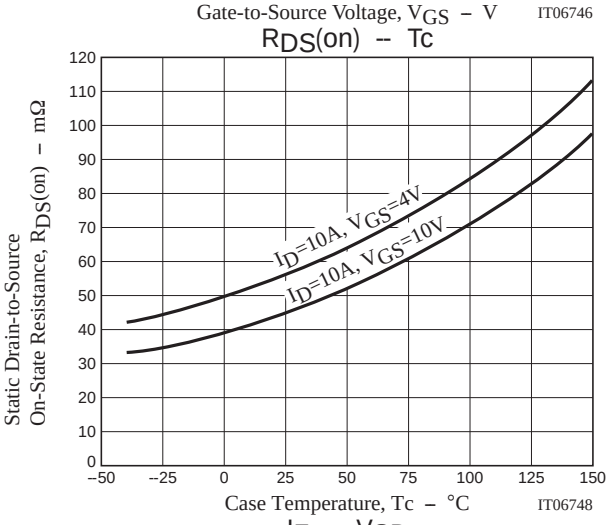
Ordering Information

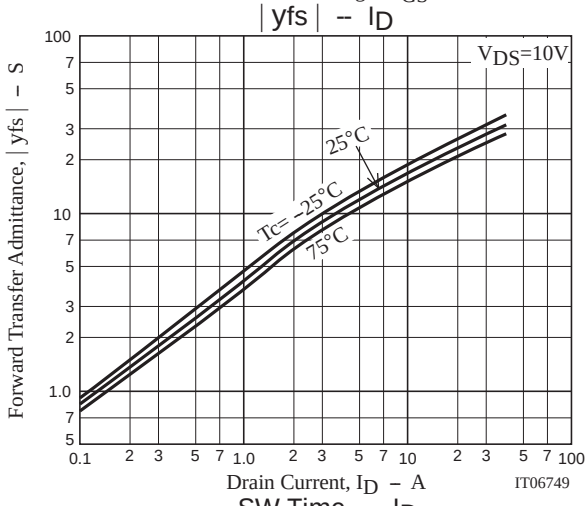
Device	Package	Shipping	memo
2SK3707-1E	TO-220F-3SG	50pcs./magazine	Pb Free

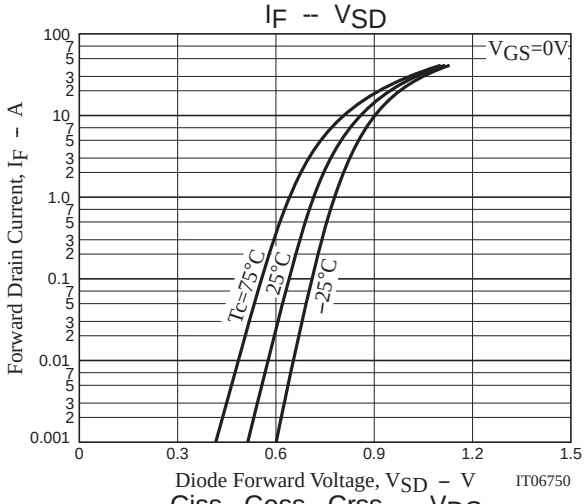

ID – VDS
Tc=25°C
8V
6V
4V
10V
VGS=3V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT06745

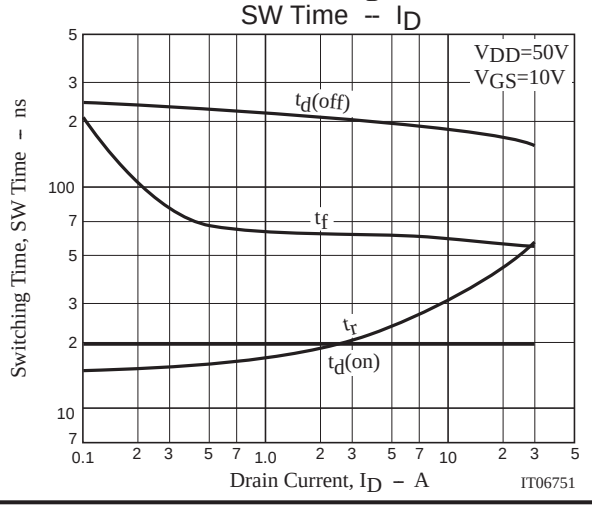

ID – VGS
VDS=10V
25°C
Tc=–25°C
75°C
Tc=75°C
25°C
–25°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT06746

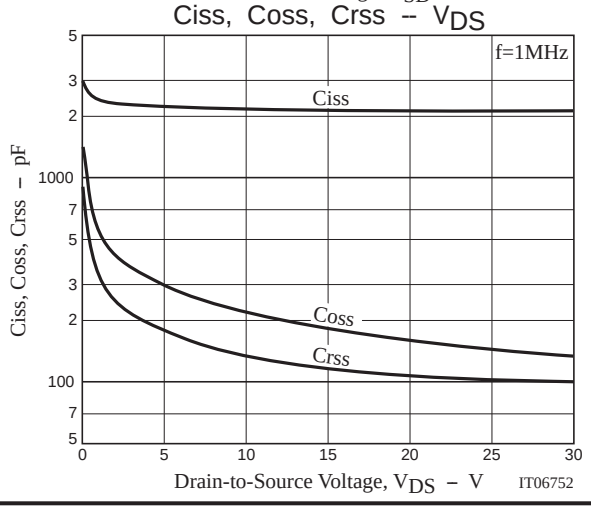

RDS(on) – VGS
ID=10A
Tc=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT06747

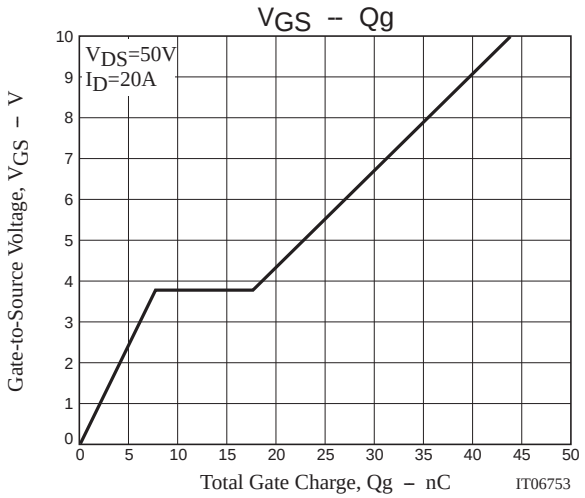

RDS(on) – Tc
ID=10A, VGS=4V
ID=10A, VGS=10V
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Case Temperature, Tc – °C
IT06748

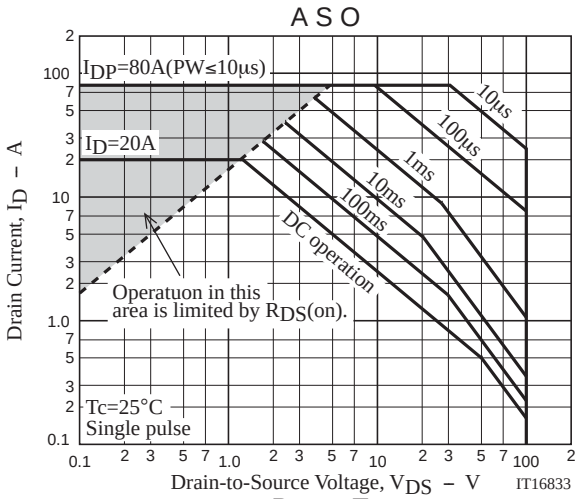

| yfs | – ID
VDS=10V
25°C
Tc=–25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT06749

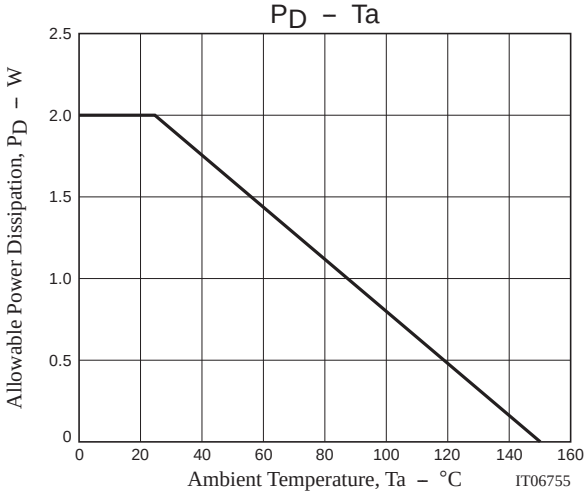

IF – VSD
VGS=0V
Tc=75°C
25°C
–25°C
Forward Drain Current, IF – A
Diode Forward Voltage, VSD – V
IT06750

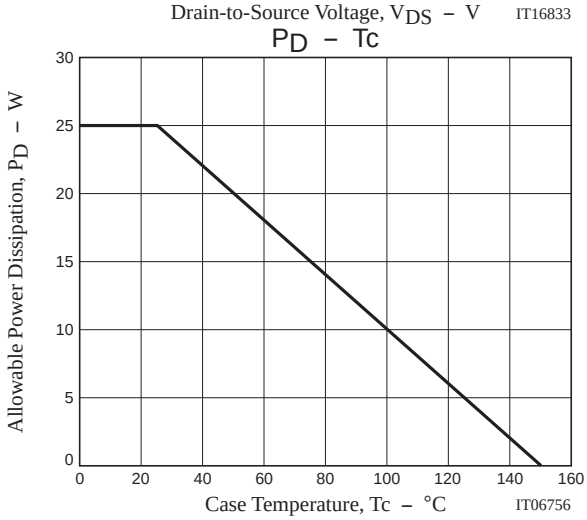

SW Time – ID
VDD=50V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT06751


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT06752


VGS – Qg
VDS=50V
ID=20A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT06753


A S O
IDP=80A(PW≤10μs)
ID=20A
10μs
100μs
1ms
10ms
100ms
DC operation
Operatuon in this
area is limited by RDS(on).
Tc=25°C
Single pulse
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT16833


PD – Ta
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT06755


PD – Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
IT06756

Magazine Specification

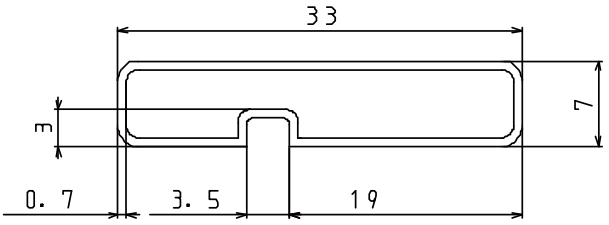
2SK3707-1E

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-3SG	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

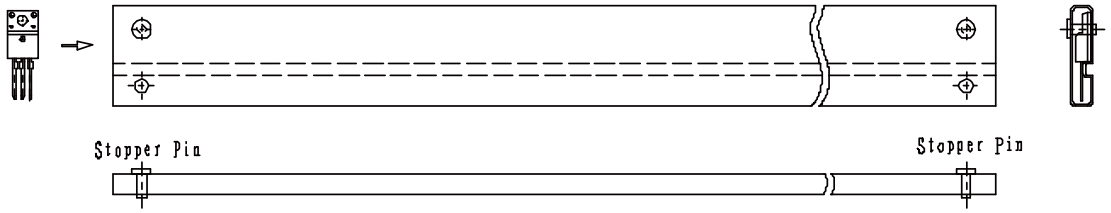
2. Magazine dimensions

(unit:mm)

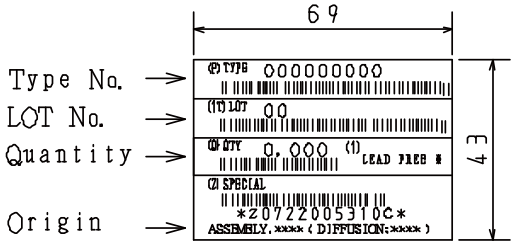


Tolerance=±0.3mm
Thickness=0.7±0.2mm
Length =532.5±2mm
Material =PVC (Antistatic treatment)

3. Storage method to magazine

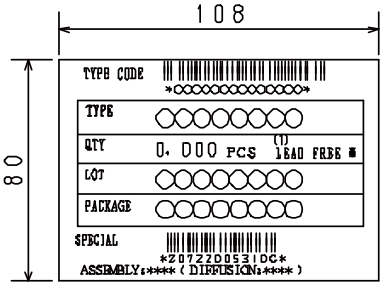


4. Inner box label (unit:mm)



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.

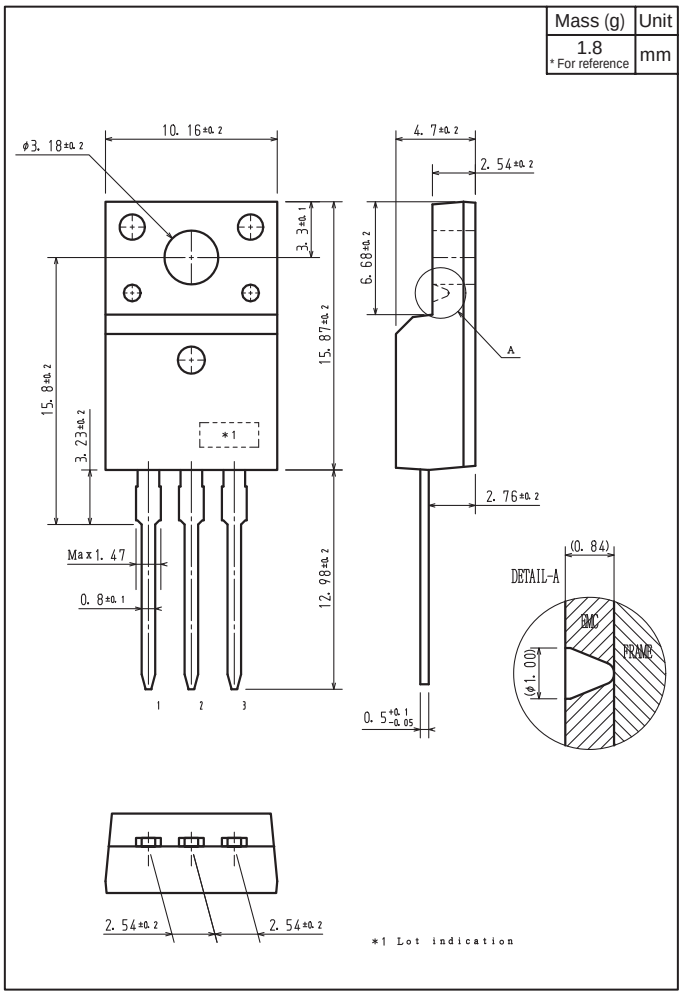


NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A

Outline Drawing

2SK3707-1E



Note on usage : Since the 2SK3707 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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