Ordering number : EN7625A

2SJ652

P-Channel Power MOSFET
−60V, −28A, 38mΩ, TO-220F-3SG

ON Semiconductor®
http://onsemi.com

Features

- ON-resistance $R_{DS}(on)1$=28.5mΩ(typ.)
- Input capacitance Ciss=4360pF (typ.)
- 4V drive

Specifications

Absolute Maximum Ratings at Ta=25°C

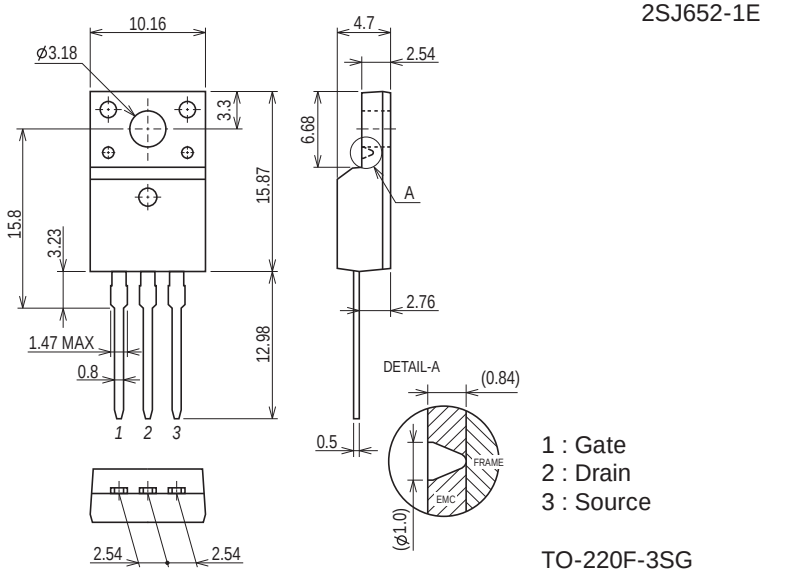
Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		−60	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		−28	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	−112	A
Allowable Power Dissipation	P_D		2.0	W
		Tc=25°C	30	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *1	E_{AS}		343	mJ
Avalanche Current *2	I_{AV}		−28	A

Note :*1 V_{DD}=−30V, L=500μH, I_{AV}=−28A (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

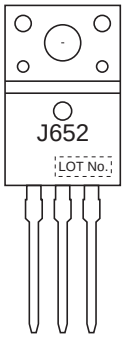
unit : mm (typ)
7529-001



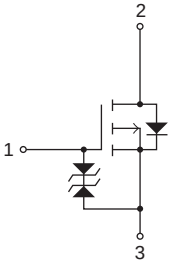
Product & Package Information

- 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	−60			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=−60V, 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=−14A	18	26		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=−14A, V_{GS}=−10V		28.5	38	mΩ
	R_{DS}(on)2	I_D=−14A, V_{GS}=−4V		39	55.5	mΩ
Input Capacitance	Ciss	V_{DS}=−20V, f=1MHz		4360		pF
Output Capacitance	Coss			470		pF
Reverse Transfer Capacitance	Crss			335		pF
Turn-ON Delay Time	t_d(on)	See Fig.2		33		ns
Rise Time	t_r			210		ns
Turn-OFF Delay Time	t_d(off)			310		ns
Fall Time	t_f			180		ns
Total Gate Charge	Qg	V_{DS}=−30V, V_{GS}=−10V, I_D=−28A		80		nC
Gate-to-Source Charge	Qgs			15		nC
Gate-to-Drain “Miller” Charge	Qgd			12		nC
Diode Forward Voltage	V_{SD}	I_S=−28A, V_{GS}=0V		−0.96	−1.2	V

Fig.1 Avalanche Resistance Test Circuit

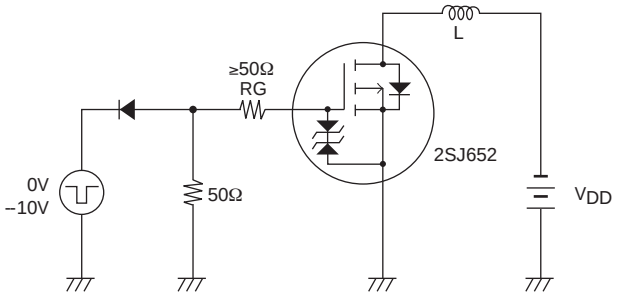
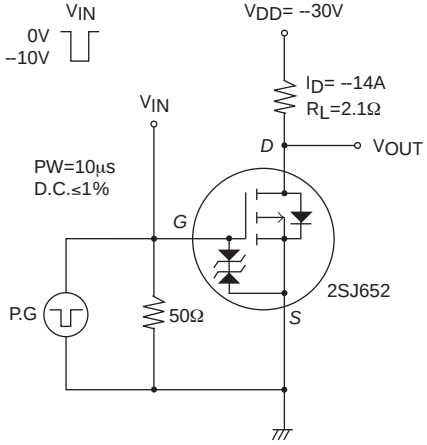
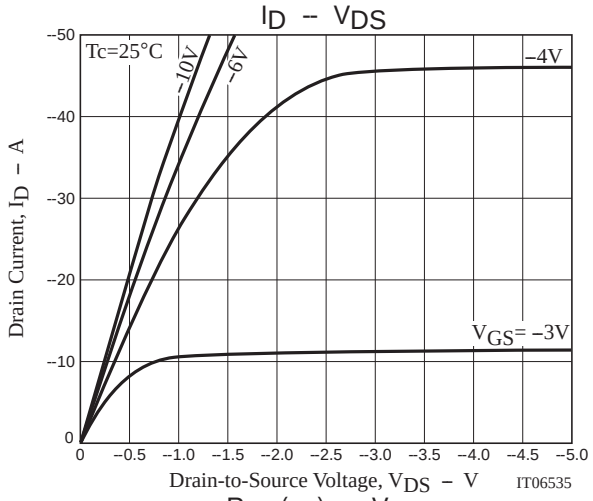


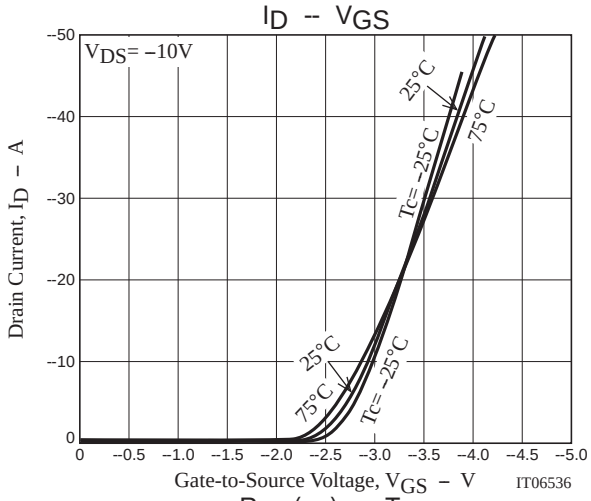
Fig.2 Switching Time Test Circuit

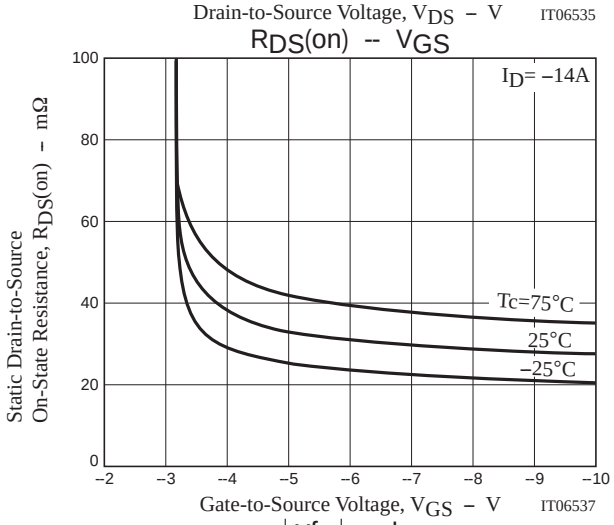


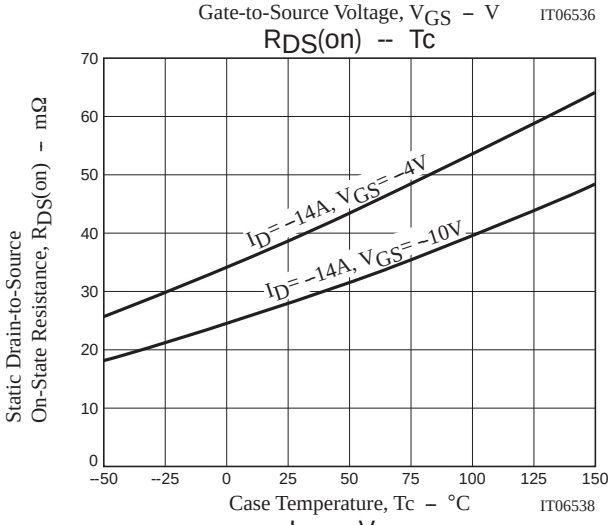
Ordering Information

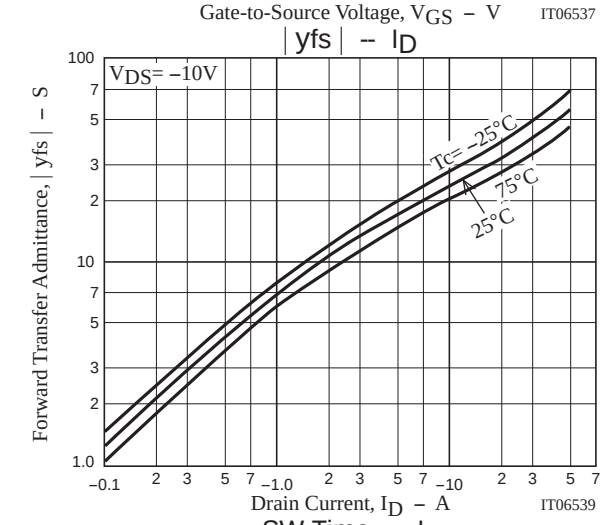
Device	Package	Shipping	memo
2SJ652-1E	TO-220F-3SG	50pcs./magazine	Pb Free

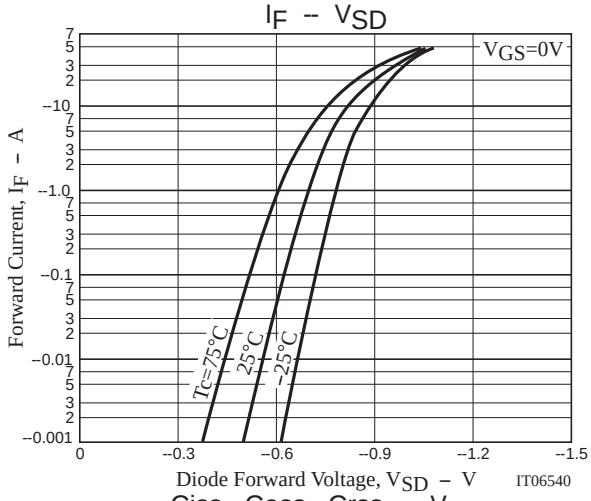

ID – VDS
Tc=25°C
–10V
–6V
–4V
VGS= –3V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT06535

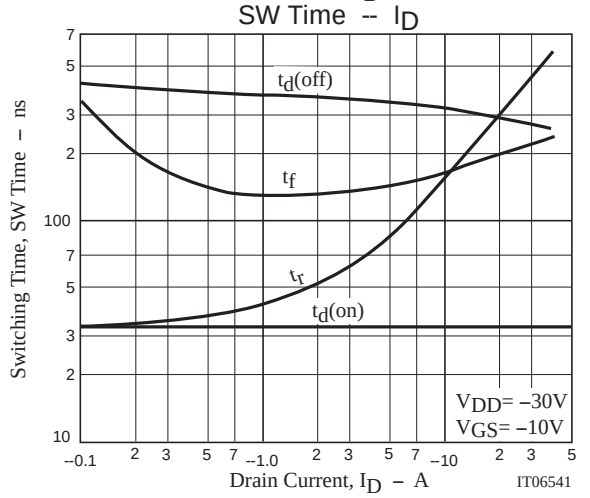

ID – VGS
VDS= –10V
25°C
75°C
Tc= –25°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT06536

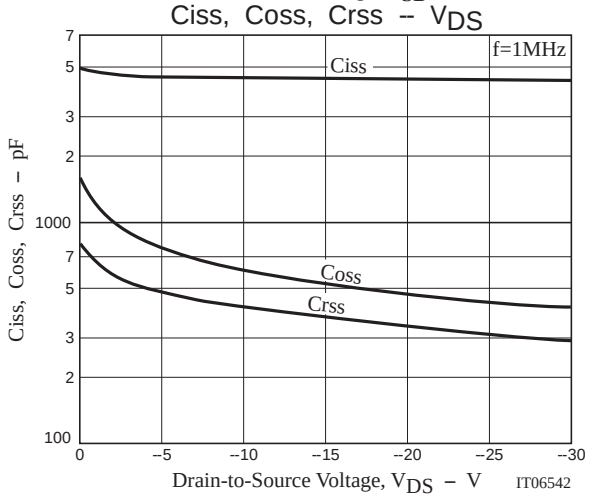

RDS(on) – VGS
ID= –14A
Tc=75°C
25°C
–25°C
Static Drain-to-Source
On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT06537

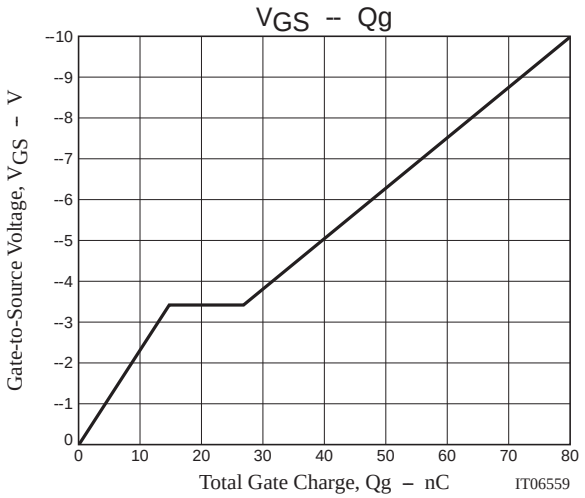

RDS(on) – Tc
ID= –14A, VGS= –4V
ID= –14A, VGS= –10V
Static Drain-to-Source
On-State Resistance, RDS(on) – mΩ
Case Temperature, Tc – °C
IT06538

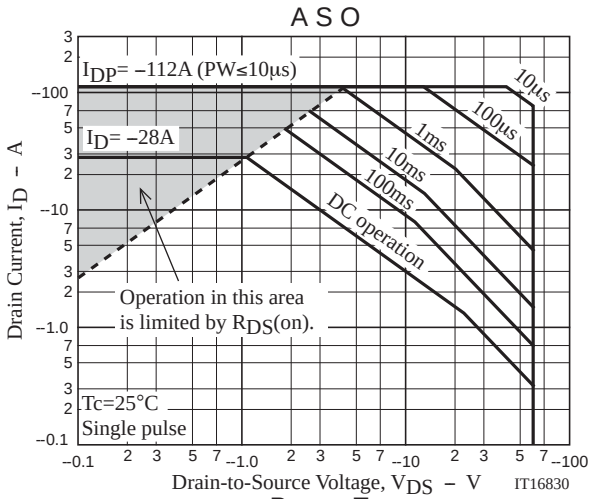

| yfs | – ID
VDS= –10V
Tc= –25°C
75°C
25°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT06539

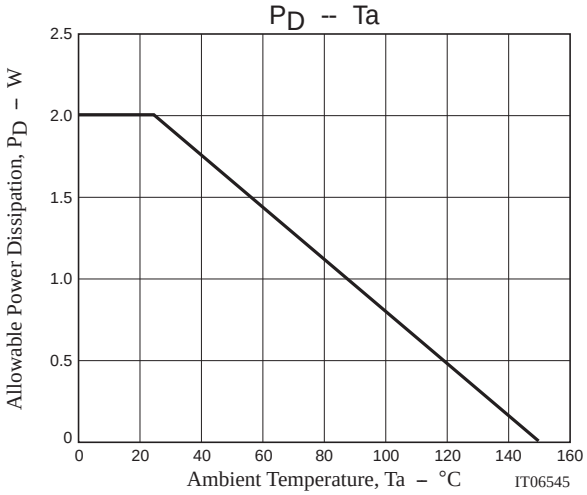

IF – VSD
VGS=0V
Tc=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT06540

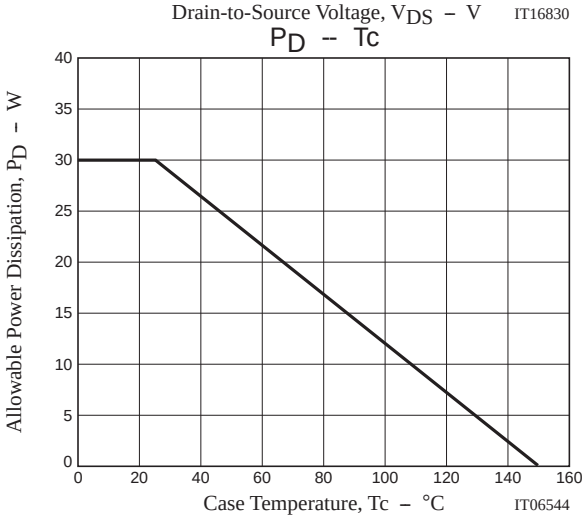

SW Time – ID
td(off)
tf
tr
td(on)
VDD= –30V
VGS= –10V
Switching Time, SW Time – ns
Drain Current, ID – A
IT06541


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT06542


VGS -- Qg
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT06559


A S O
IDP= –112A (PW≤10μs)
ID= –28A
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
IT16830


PD -- Ta
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT06545


PD -- Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
IT06544

Magazine Specification

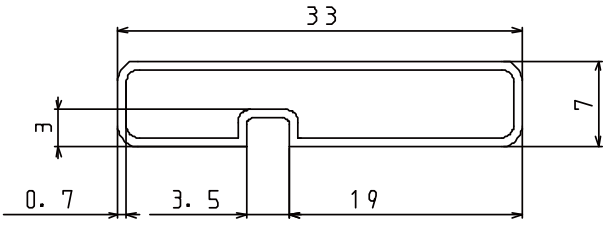
2SJ652-1E

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

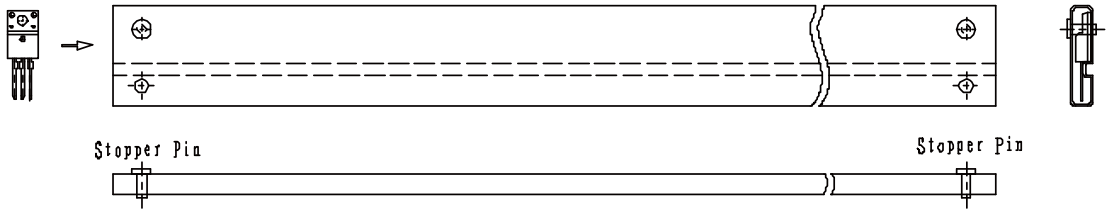
2. Magazine dimensions

(unit:mm)

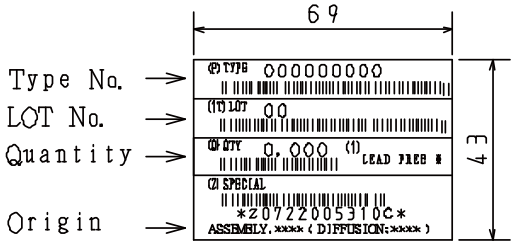


Tolerance=±0.3mm
Thickness=0.7±0.2mm
Length =532.5±2mm
Material =PVC (Antistatic treatment)

3. Storage method to magazine

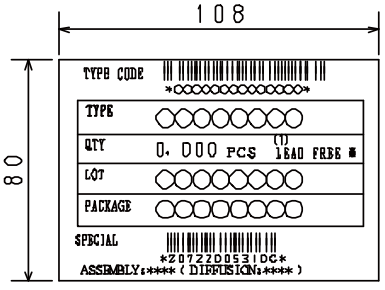


4. Inner box label (unit:mm)



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.

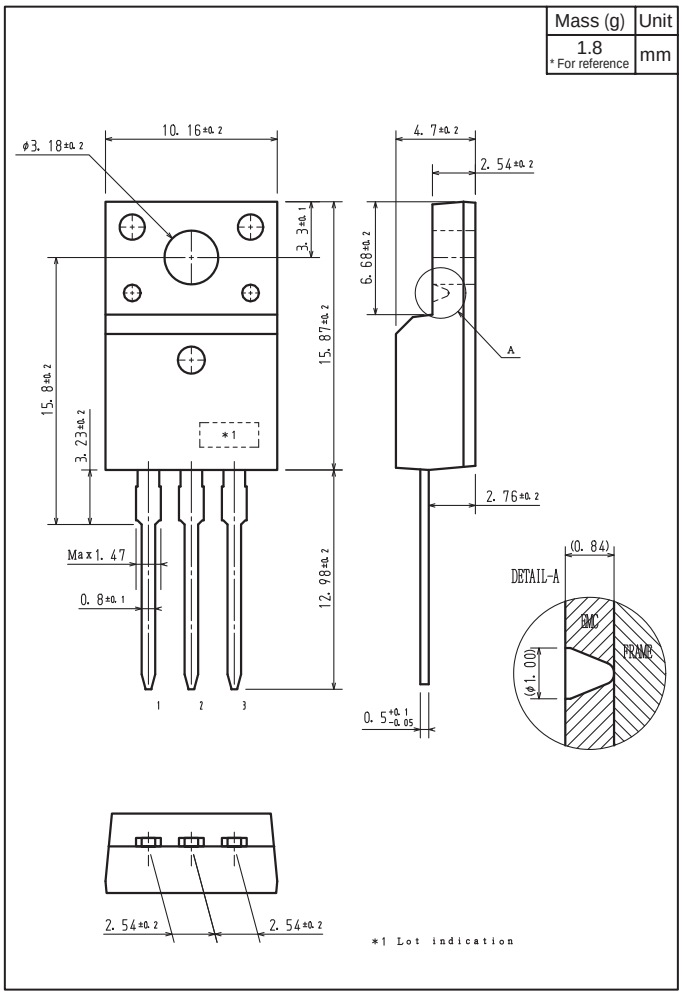


NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A

Outline Drawing

2SJ652-1E



Note on usage : Since the 2SJ652 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.