Ordering number : ENA1907A

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

P-Channel Silicon MOSFET

BMS3003 — General-Purpose Switching Device Applications

Features

- ON-resistance $R_{DS}(on)1$=5.0mΩ (typ.)
- Input capacitance Ciss=13200pF (typ.)
- 4V drive

Specifications

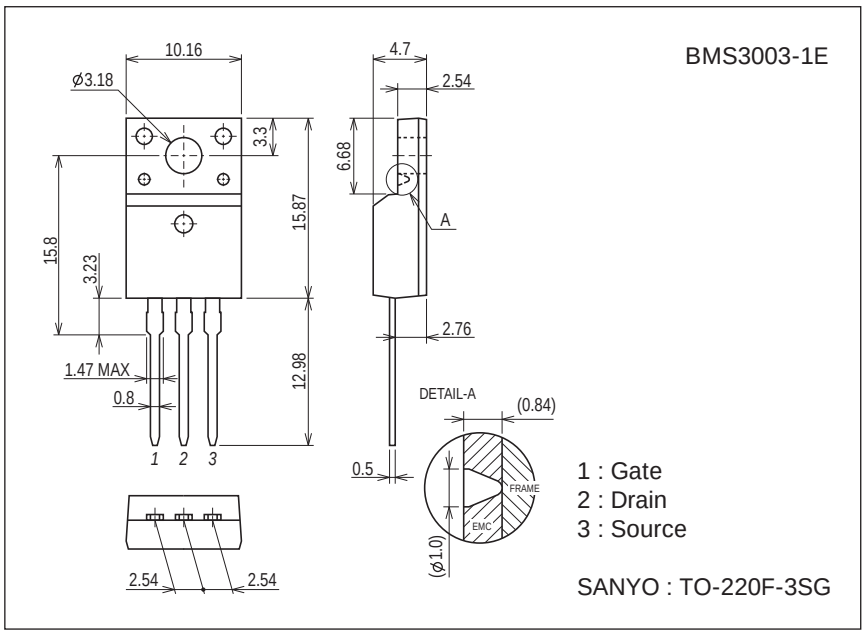
Absolute Maximum Ratings at Ta=25°C

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		−78	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	−312	A
Allowable Power Dissipation	P_D		2.0	W
		Tc=25°C	40	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *1	E_{AS}		420	mJ
Avalanche Current *2	I_{AV}		−60	A

Note :*1 V_{DD}=−36V, L=100μH, I_{AV}=−60A (Fig.1)
*2 L≤100μH, Single pulse

Package Dimensions

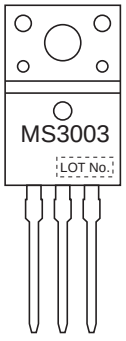
unit : mm (typ.)
7529-001



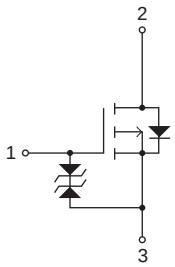
Product & Package Information

- 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			−10	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=−39A		130		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=−39A, V_{GS}=−10V		5.0	6.5	mΩ
	R_{DS}(on)2	I_D=−39A, V_{GS}=−4V		6.5	9.0	mΩ
Input Capacitance	Ciss	V_{DS}=−20V, f=1MHz		13200		pF
Output Capacitance	Coss			1300		pF
Reverse Transfer Capacitance	Crss			950		pF
Turn-ON Delay Time	t_d(on)	See Fig.2		90		ns
Rise Time	t_r			360		ns
Turn-OFF Delay Time	t_d(off)			1200		ns
Fall Time	t_f			680		ns
Total Gate Charge	Qg	V_{DS}=−36V, V_{GS}=−10V, I_D=−78A		285		nC
Gate-to-Source Charge	Qgs			35		nC
Gate-to-Drain “Miller” Charge	Qgd			70		nC
Diode Forward Voltage	V_{SD}	I_S=−78A, V_{GS}=0V		−0.95	−1.5	V
Reverse Recovery Time	t_{rr}	See Fig.3		150		ns
Reverse Recovery Charge	Q_{rr}	I_S=−78A, V_{GS}=0V, di/dt=−100A/μs		470		nC

Fig.1 Unclamped Inductive Switching Test Circuit

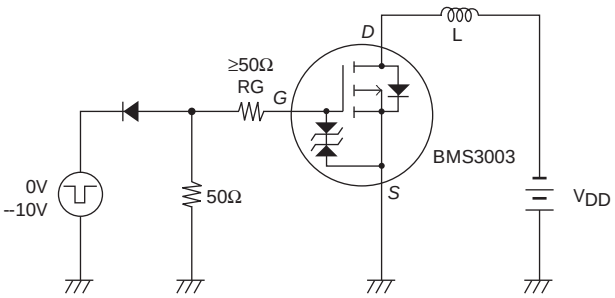


Fig.2 Switching Time Test Circuit

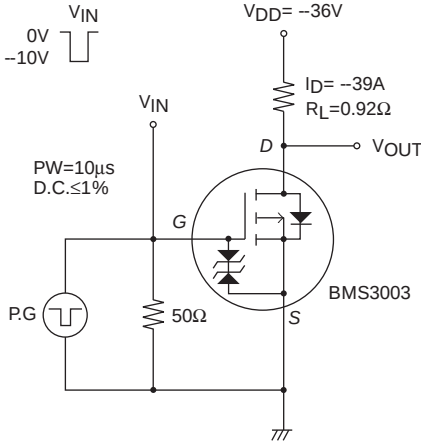
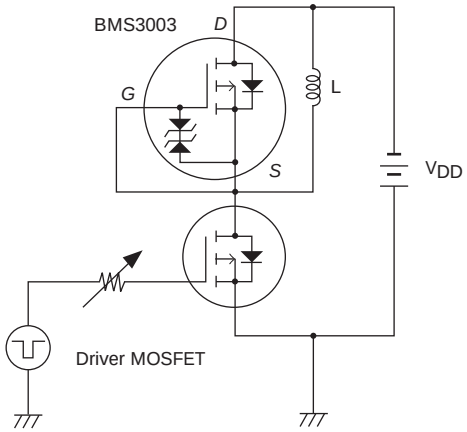
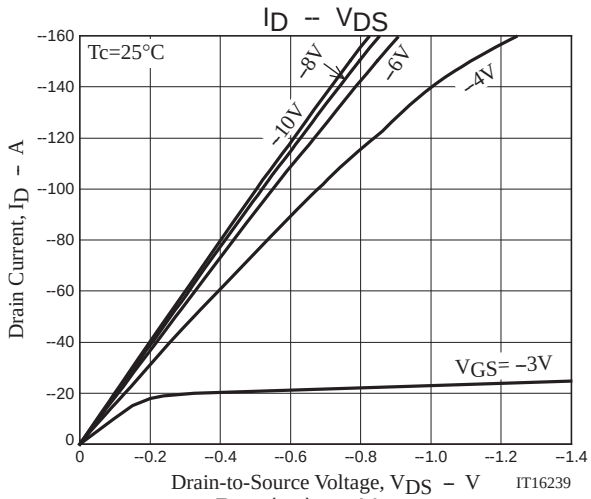


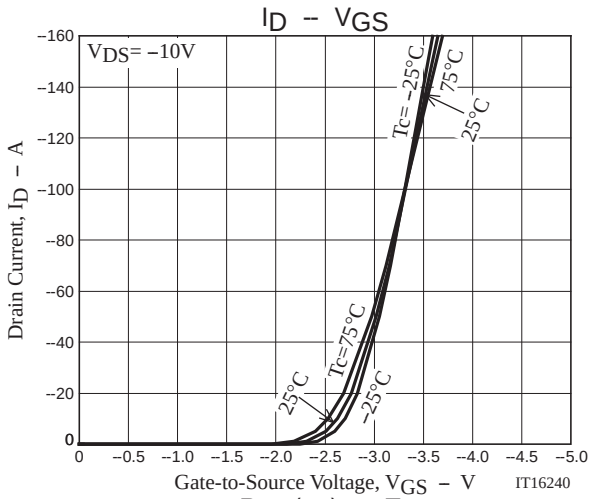
Fig.3 Reverse Recovery Time Test Circuit

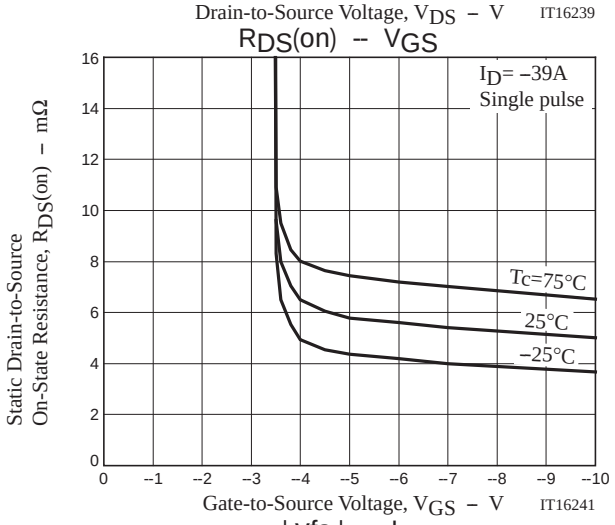


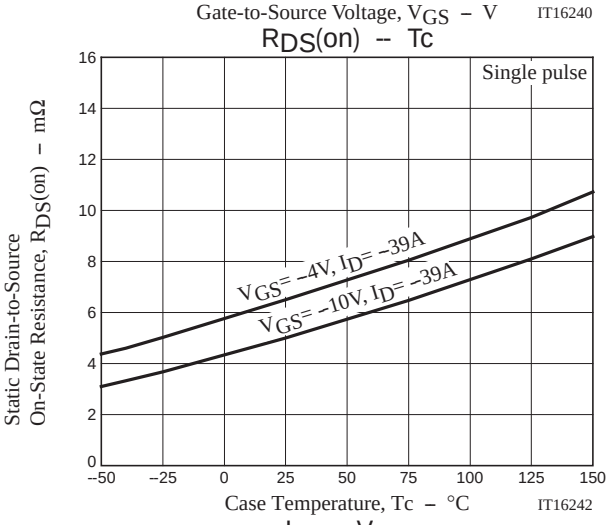
Ordering Information

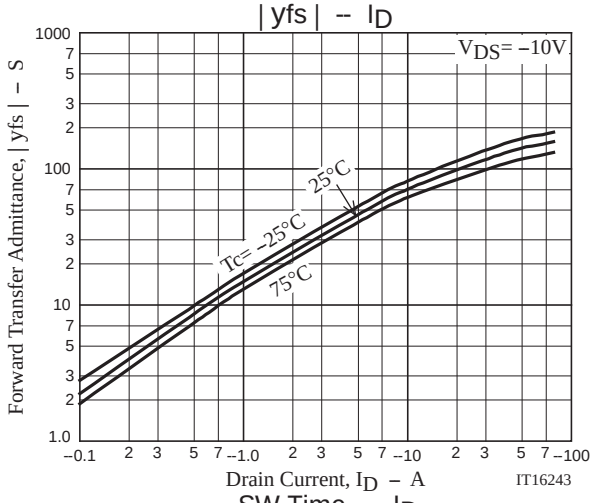
Device	Package	Shipping	memo
BMS3003-1E	TO-220F-3SG	50pcs./magazine	Pb Free

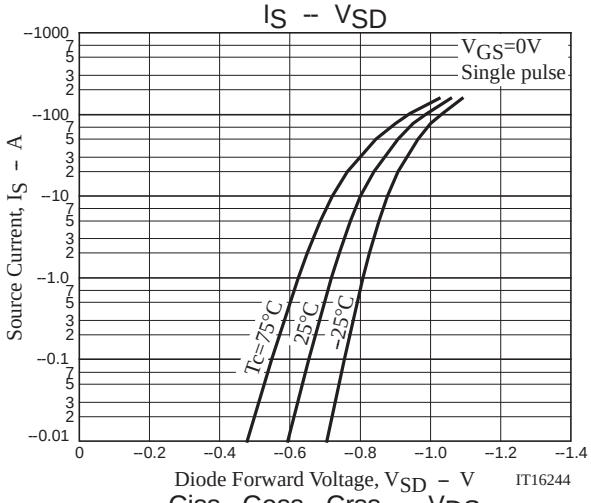

ID -- VDS
Tc=25°C
–8V
–6V
–4V
–10V
VGS= –3V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT16239

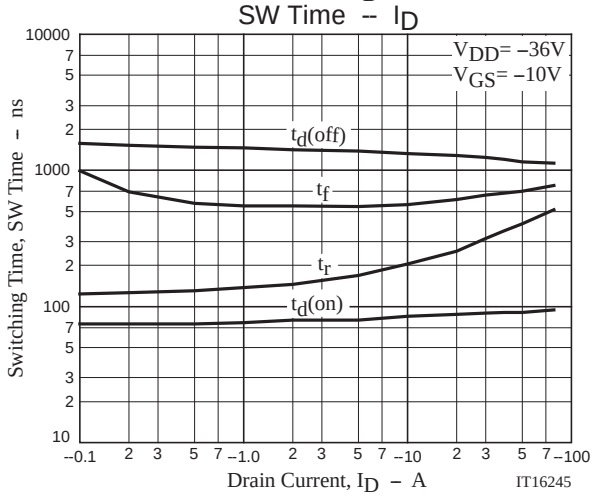

ID -- VGS
VDS= –10V
Tc= –25°C
75°C
25°C
Tc=75°C
25°C
–25°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT16240

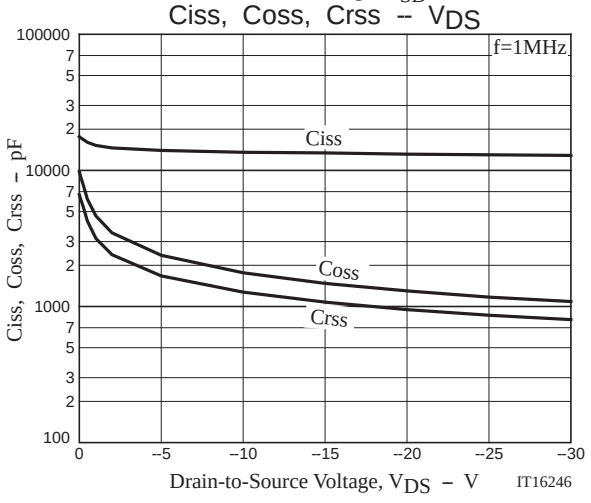

RDS(on) -- VGS
ID= –39A
Single pulse
Tc=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT16241

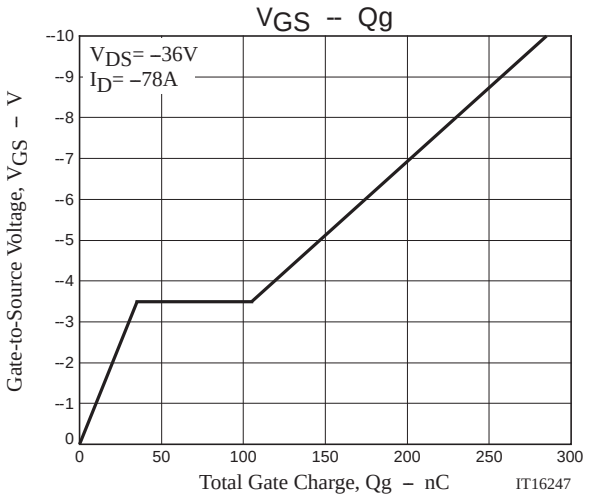

RDS(on) -- Tc
Single pulse
VGS= –4V, ID= –39A
VGS= –10V, ID= –39A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Case Temperature, Tc – °C
IT16242

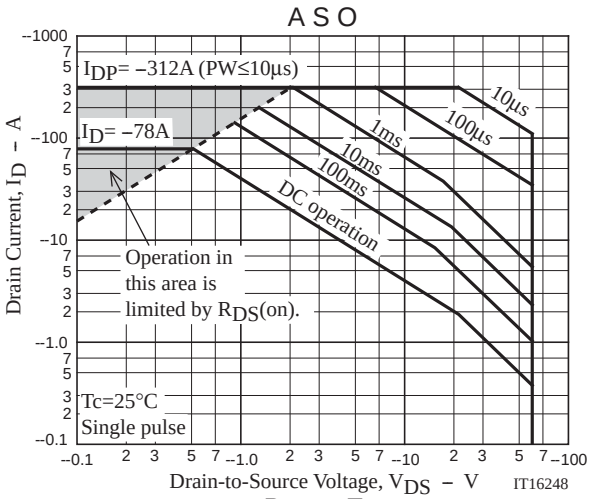

| yfs | -- ID
VDS= –10V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT16243

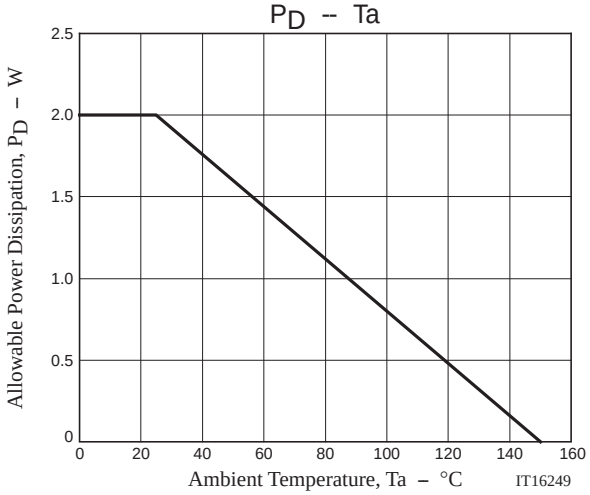

IS -- VSD
VGS=0V
Single pulse
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT16244

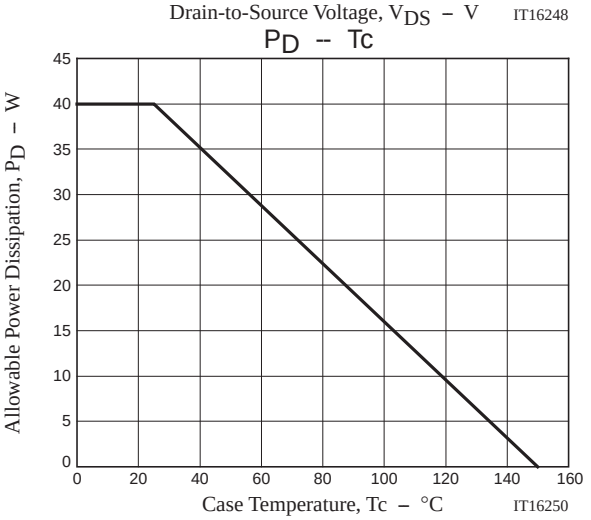

SW Time -- ID
VDD= –36V
VGS= –10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT16245

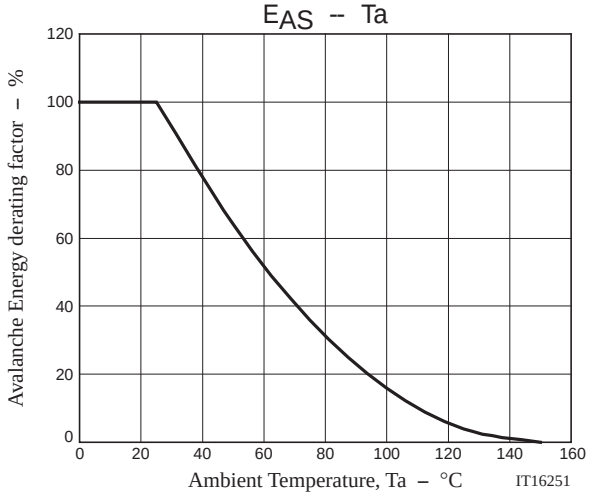

Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT16246


VGS – Qg
VDS= –36V
ID= –78A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT16247


A S O
IDP= –312A (PW≤10μs)
ID= –78A
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
IT16248


PD – Ta
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT16249


PD – Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
IT16250


EAS – Ta
Avalanche Energy derating factor – %
Ambient Temperature, Ta – °C
IT16251

Magazine Specification

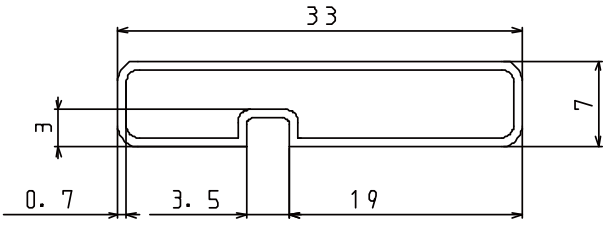
BMS3003-1E

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

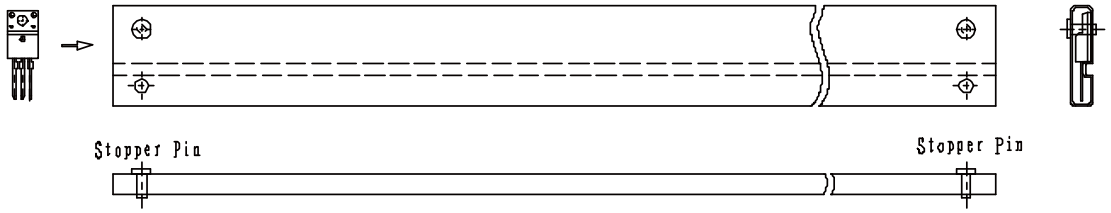
2. Magazine dimensions

(unit:mm)

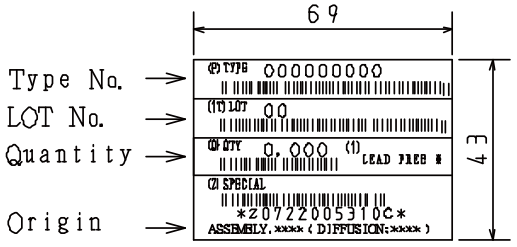


Tolerance=±0.3mm
Thickness=0.7±0.2mm
Length =532.5±2mm
Material =PVC (Antistatic treatment)

3. Storage method to magazine

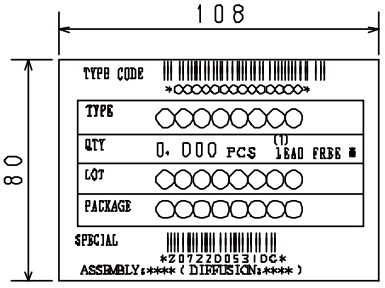


4. Inner box label (unit:mm)



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.

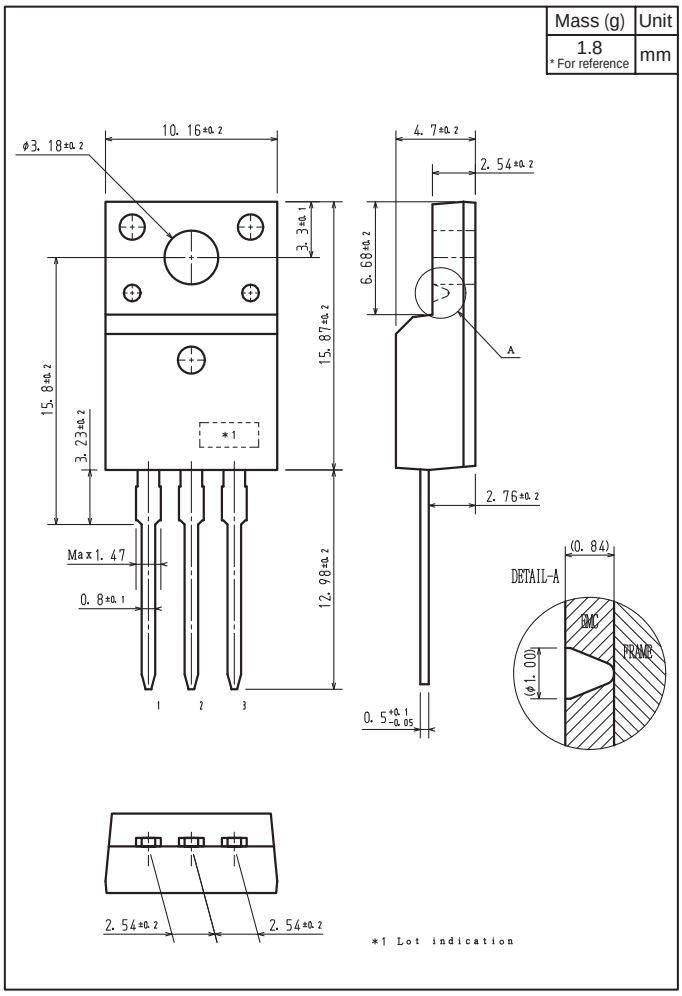


NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A

Outline Drawing

BMS3003-1E



Note on usage : Since the BMS3003 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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