Ordering number : ENA1907B

BMS3003

P-Channel Power MOSFET
−60V, −78A, 6.5mΩ, TO-220F-3SG

ON Semiconductor®
http://onsemi.com

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

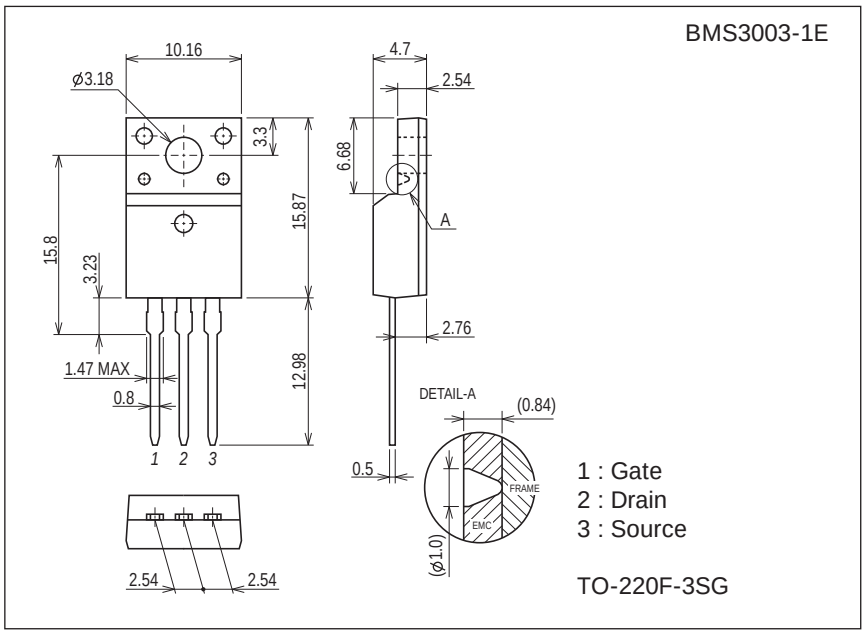
Parameter	Symbol	Conditions	Ratings	Unit
Drain to Source Voltage	V_{DSS}		−60	V
Gate to Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		−78	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	−312	A
Allowable Power Dissipation	P_D		2.0	W
		Tc=25°C	40	W
Channel Temperature	Tch		150	°C
Storage 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

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

Package Dimensions

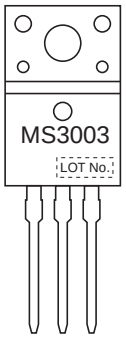
unit : mm (typ.)
7529-001



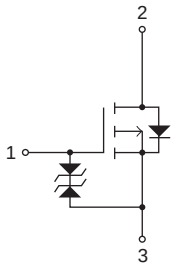
Product & Package Information

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

Marking



Electrical Connection



ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

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

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

Fig.1 Unclamped Inductive Switching Test Circuit

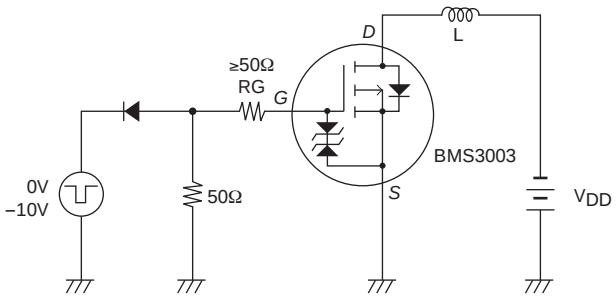


Fig.2 Switching Time Test Circuit

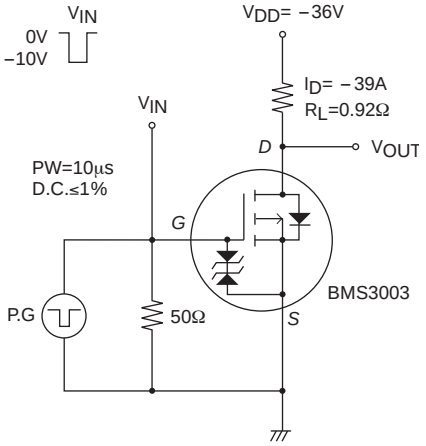
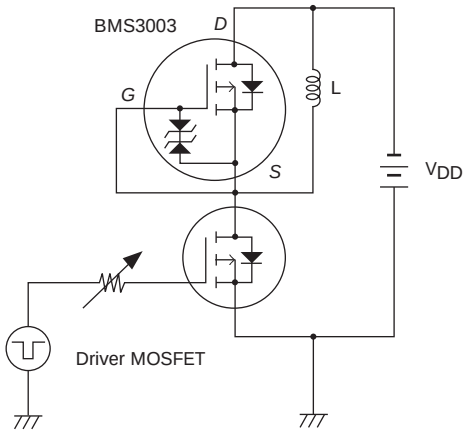
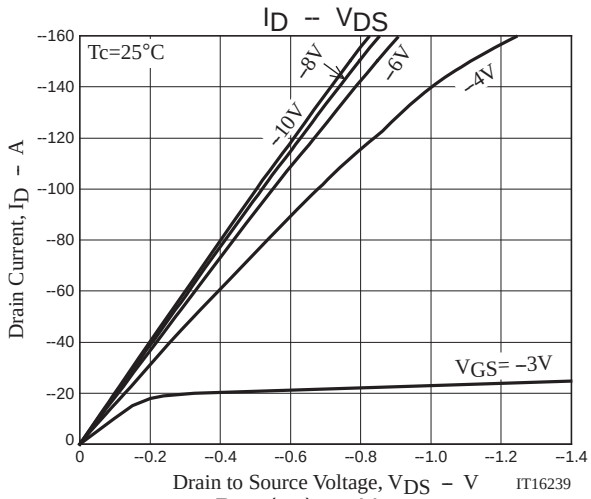


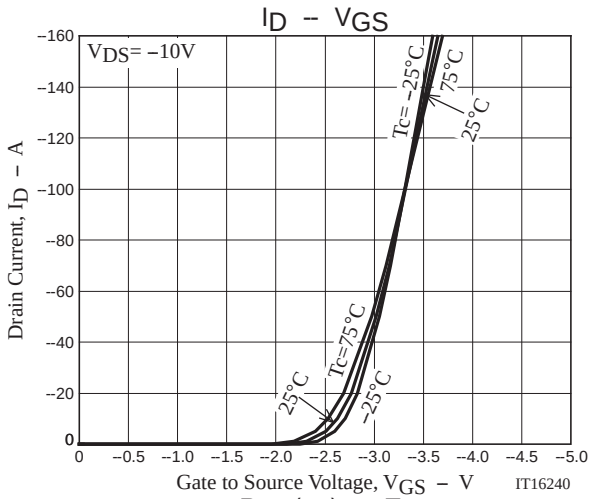
Fig.3 Reverse Recovery Time Test Circuit

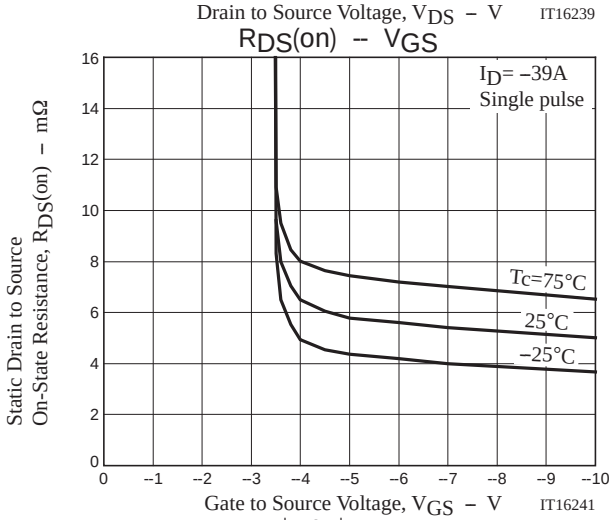


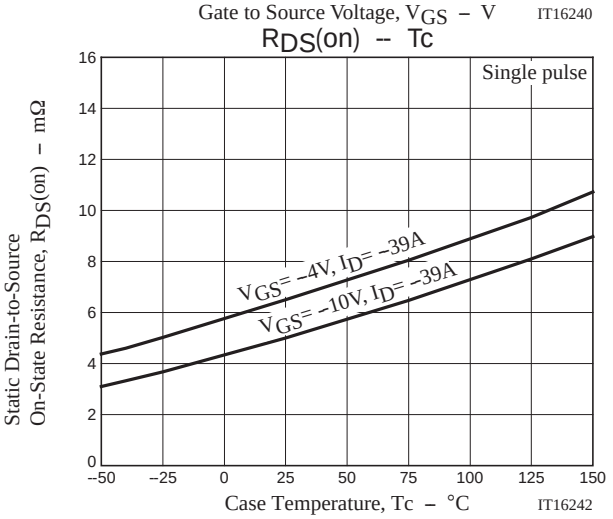
Ordering Information

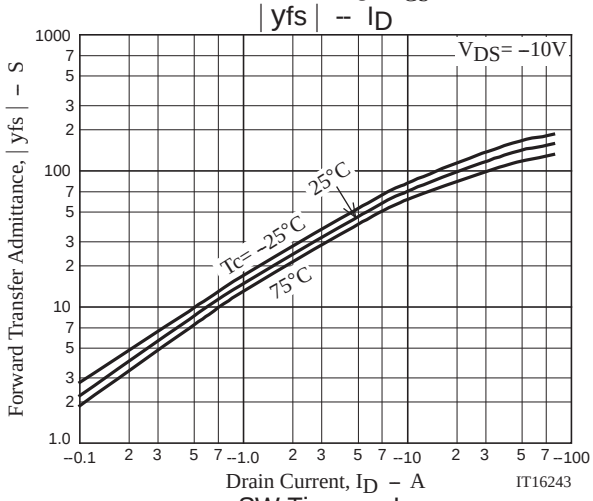
Device	Package	Shipping	memo
BMS3003-1E	TO-220F-3SG	50pcs./tube	Pb Free

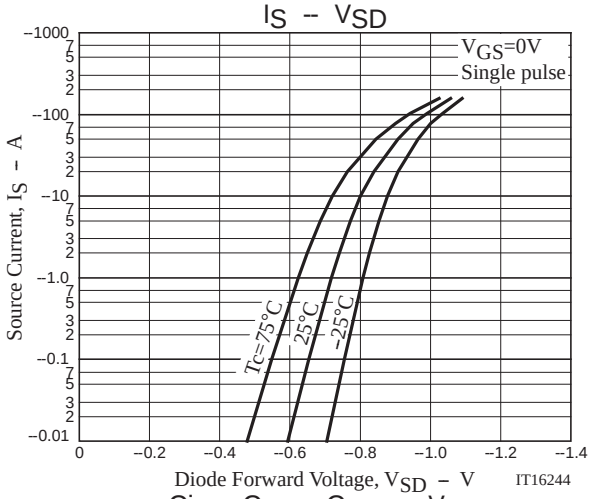

ID -- VDS
Tc=25°C
–8V
–6V
–4V
–10V
VGS= –3V
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT16239

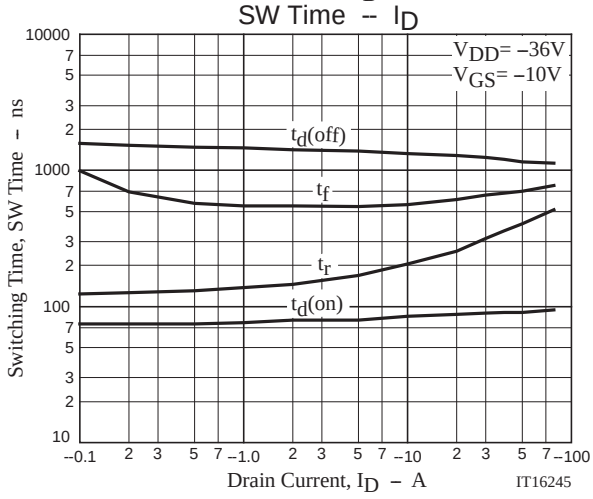

ID -- VGS
VDS= –10V
Tc= –25°C
75°C
25°C
Tc=75°C
25°C
–25°C
Drain Current, ID – A
Gate to Source Voltage, VGS – V
IT16240

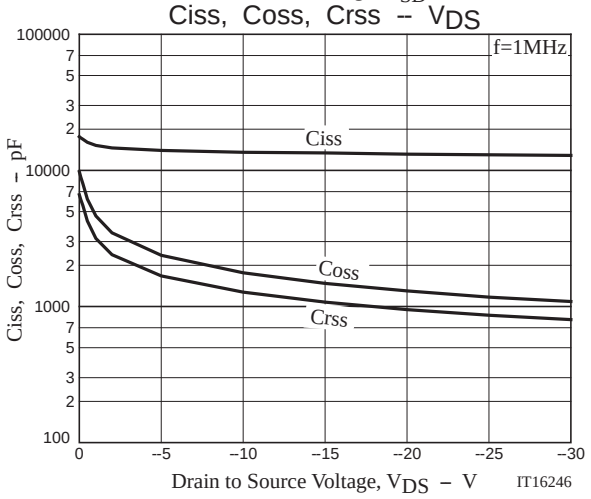

RDS(on) -- VGS
ID= –39A
Single pulse
Tc=75°C
25°C
–25°C
Static Drain to Source On-State Resistance, RDS(on) – mΩ
Gate to Source Voltage, VGS – V
IT16241

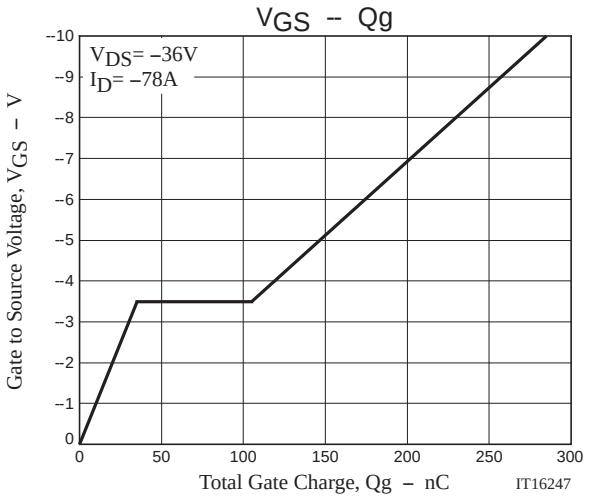

RDS(on) -- Tc
Single pulse
VGS= –4V, ID= –39A
VGS= –10V, ID= –39A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Case Temperature, Tc – °C
IT16242

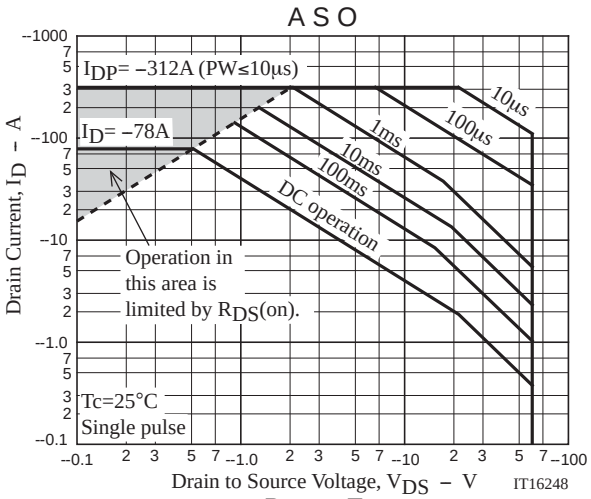

| yfs | -- ID
VDS= –10V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT16243

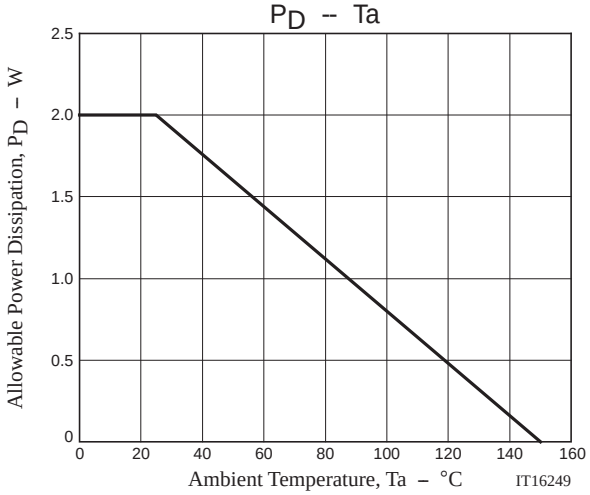

IS -- VSD
VGS=0V
Single pulse
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT16244

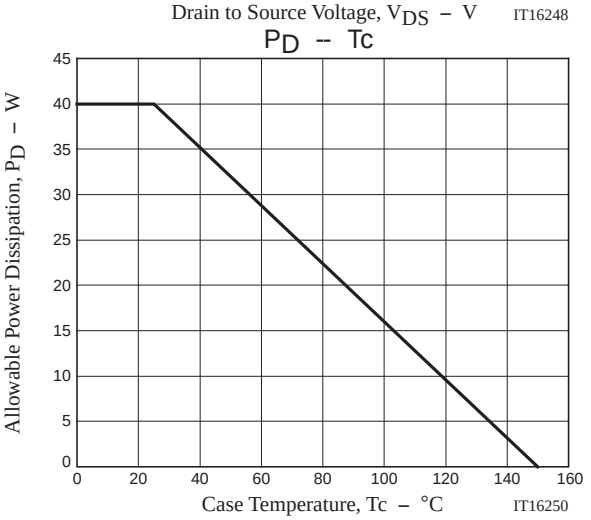

SW Time -- ID
VDD= –36V
VGS= –10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT16245

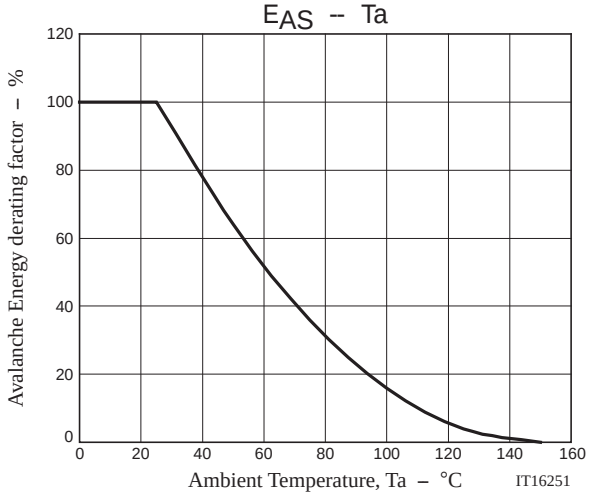

Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain to Source Voltage, VDS – V
IT16246


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

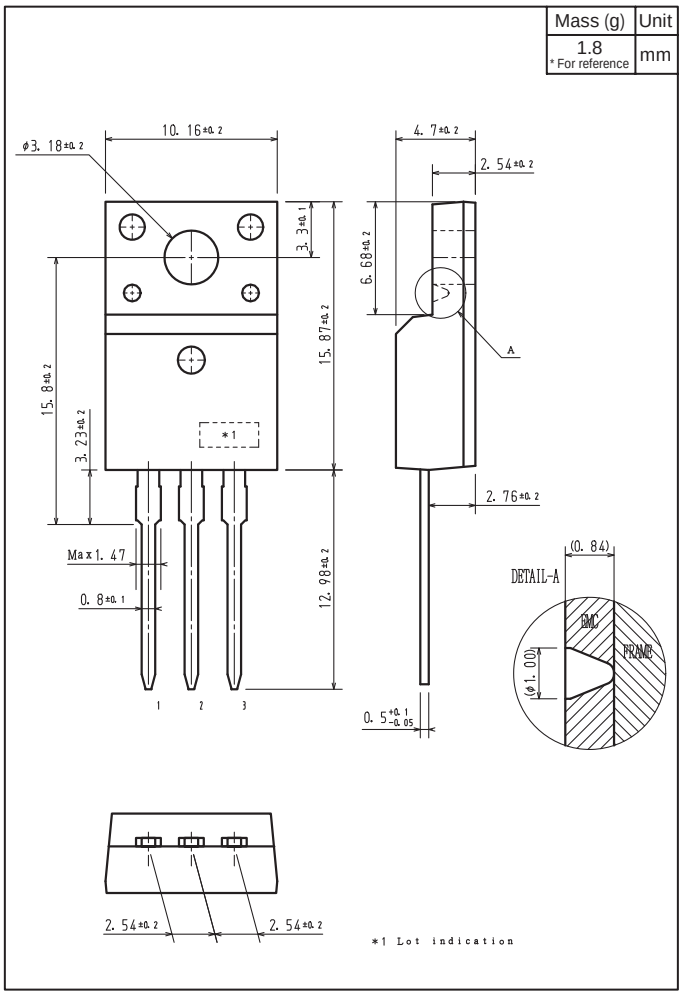

PD – Ta
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT16249


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


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

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.