Ordering number : ENA1406A

ATP104

P-Channel Power MOSFET
−30V, −75A, 8.4mΩ, Single ATPAK

ON Semiconductor®

http://onsemi.com

Features

- Low ON-resistance
- Slim package
- Halogen free compliance
- Large current
- 4.5V drive
- Protection diode in

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		−30	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		−75	A
Drain Current (PW≤10μs)	I_{DP}	PW≤10μs, duty cycle≤1%	−225	A
Allowable Power Dissipation	P_D	Tc=25°C	60	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *1	E_{AS}		130	mJ
Avalanche Current *2	I_{AV}		38	A

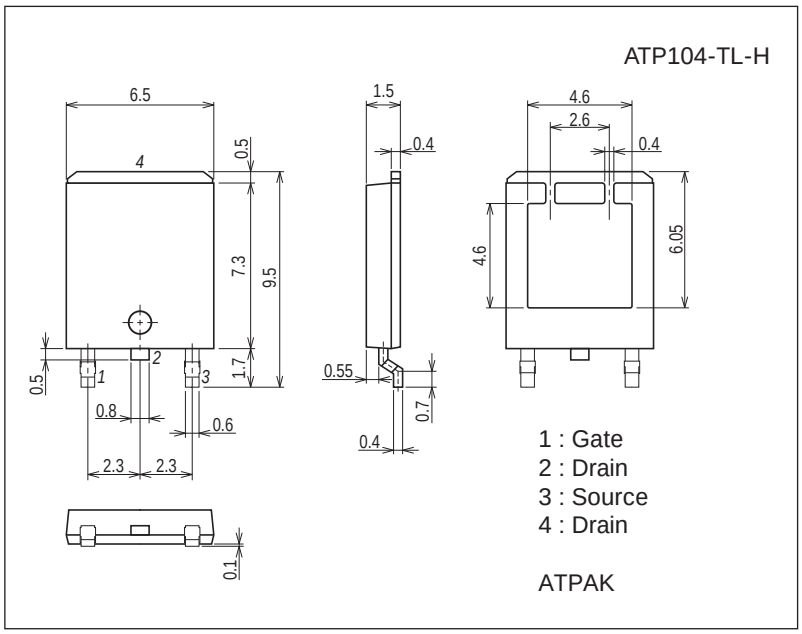
Note :*1 V_{DD}=15V, L=100μH, I_{AV}=38A
*2 L≤100μH, Single pulse

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)

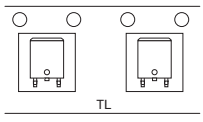
7057-001



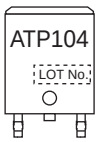
Product & Package Information

- Package : ATPAK
- JEITA, JEDEC : -
- Minimum Packing Quantity : 3,000 pcs./reel

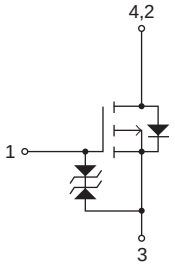
Packing Type: TL



Marking



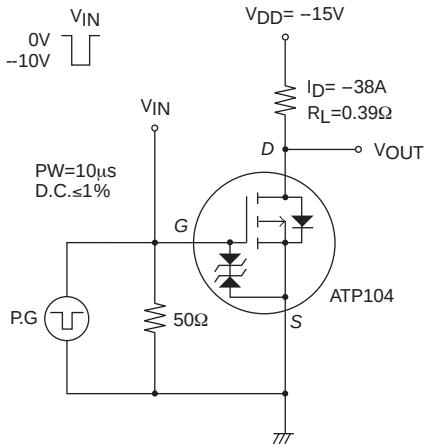
Electrical Connection



Electrical Characteristics at Ta=25°C

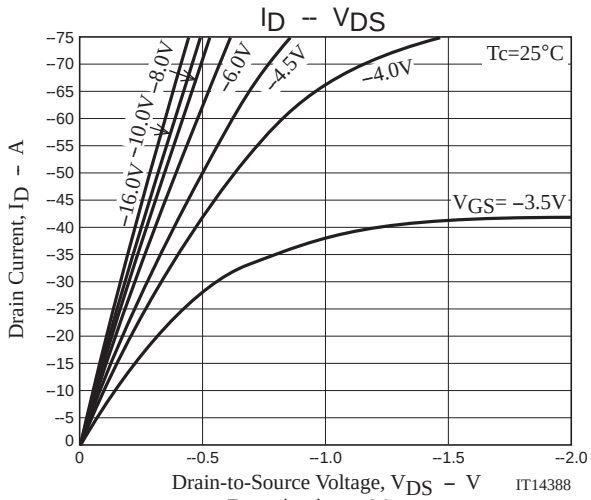
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=−1mA, V_{GS}=0V	−30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=−30V, V_{GS}=0V			−1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=−10V, I_D=−1mA	−1.2		−2.6	V
Forward Transfer Admittance	| yfs |	V_{DS}=−10V, I_D=−38A		70		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=−38A, V_{GS}=−10V		6.4	8.4	mΩ
	R_{DS}(on)2	I_D=−19A, V_{GS}=−4.5V		9.6	13.5	mΩ
Input Capacitance	Ciss	V_{DS}=−10V, f=1MHz		3950		pF
Output Capacitance	Coss			880		pF
Reverse Transfer Capacitance	Crss			610		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		24		ns
Rise Time	t_r			520		ns
Turn-OFF Delay Time	t_d(off)			290		ns
Fall Time	t_f			260		ns
Total Gate Charge	Qg	V_{DS}=−15V, V_{GS}=−10V, I_D=−75A		76		nC
Gate-to-Source Charge	Qgs			18		nC
Gate-to-Drain “Miller” Charge	Qgd			13		nC
Diode Forward Voltage	V_{SD}	I_S=−75A, V_{GS}=0V		−1.02	−1.5	V

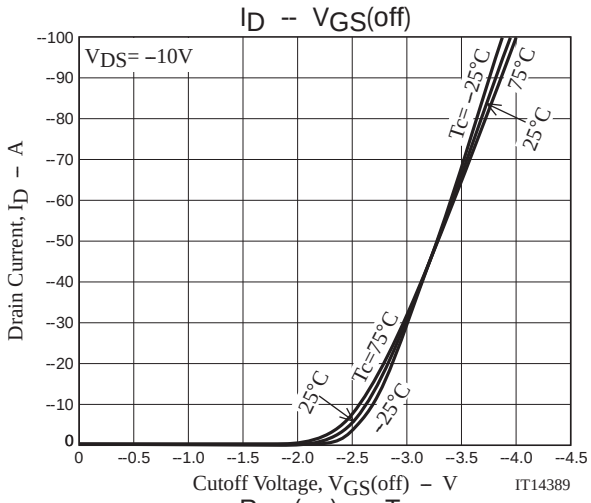
Switching Time Test Circuit

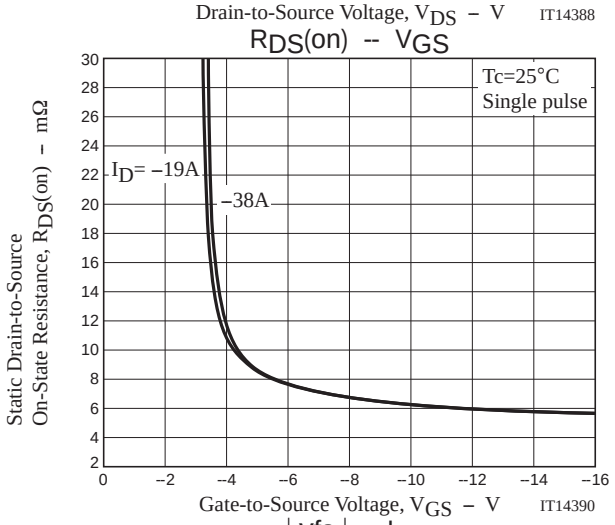


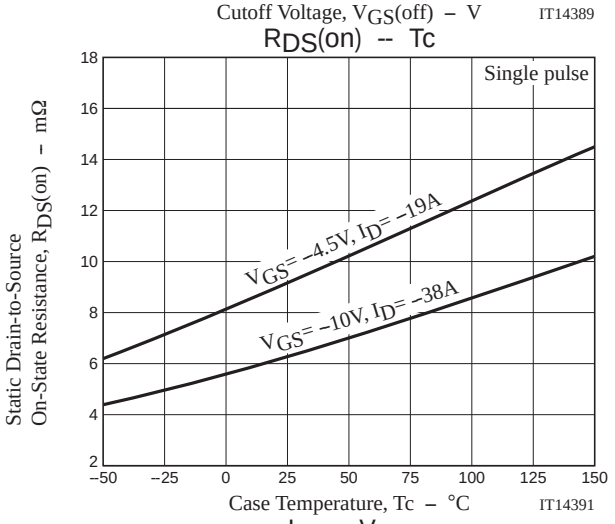
Ordering Information

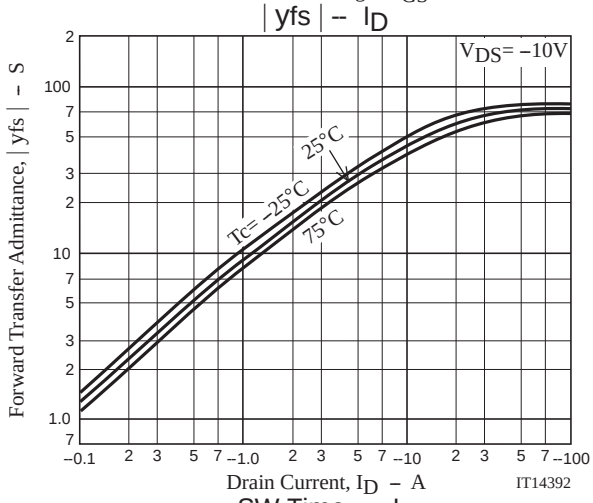
Device	Package	Shipping	memo
ATP104-TL-H	ATPAK	3,000pcs./reel	Pb Free and Halogen Free

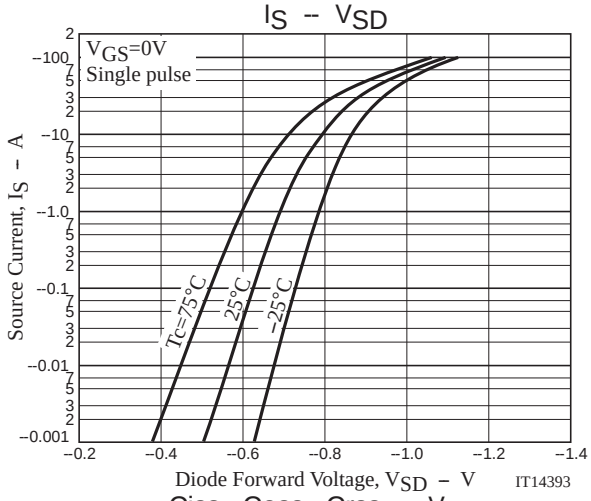

ID -- VDS
Tc=25°C
–4.0V
–4.5V
–6.0V
–8.0V
–10.0V
–16.0V
VGS= –3.5V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT14388

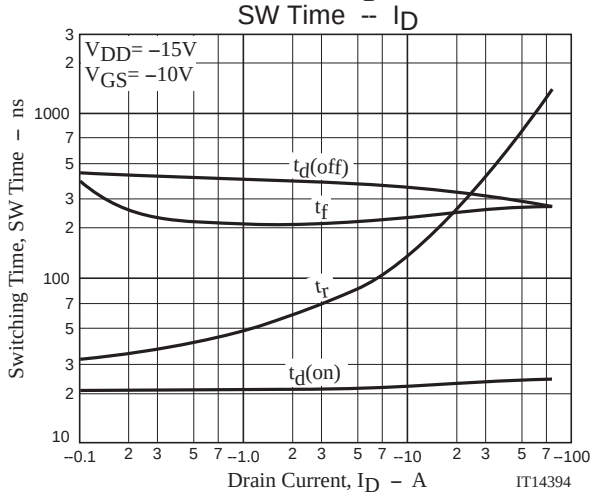

ID -- VGS(off)
VDS= –10V
Tc= –25°C
75°C
25°C
Drain Current, ID – A
Cutoff Voltage, VGS(off) – V
IT14389

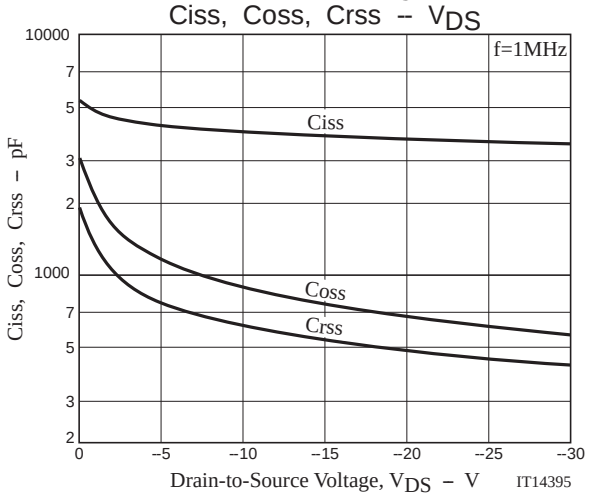

RDS(on) -- VGS
Tc=25°C
Single pulse
ID= –19A
–38A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT14390

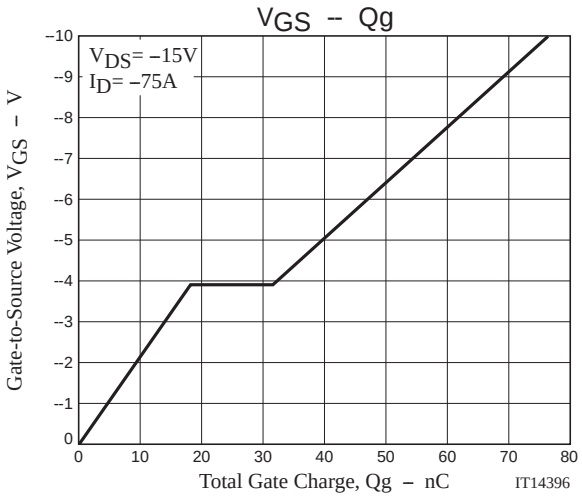

RDS(on) -- Tc
Single pulse
VGS= –4.5V, ID= –19A
VGS= –10V, ID= –38A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Case Temperature, Tc – °C
IT14391

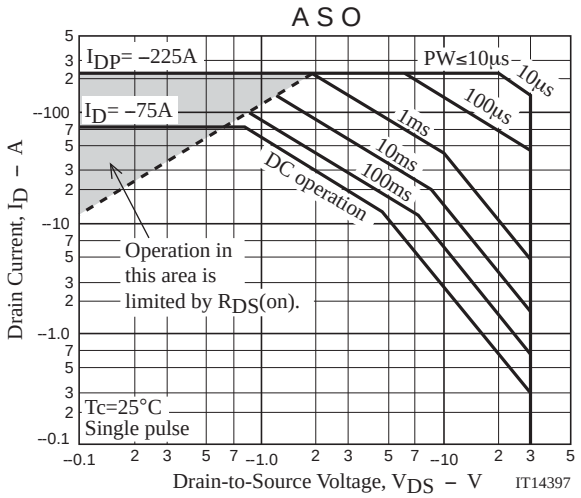

| yfs | -- ID
VDS= –10V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT14392

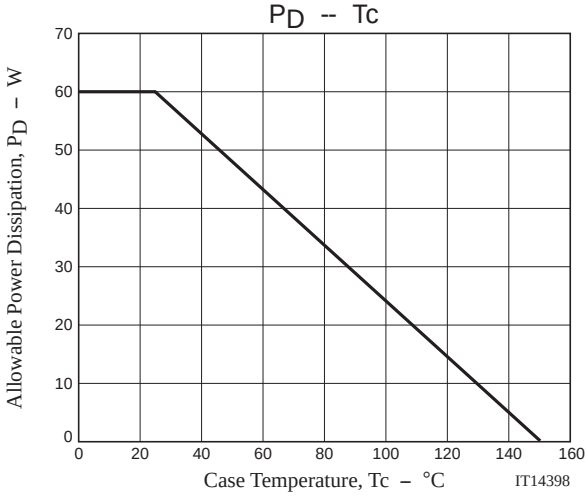

IS -- VSD
VGS=0V
Single pulse
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT14393

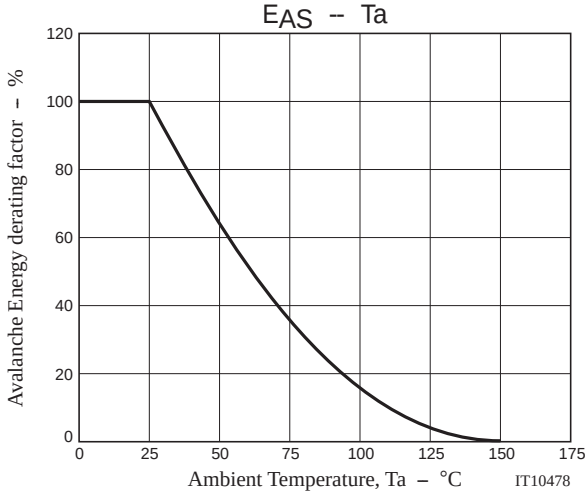

SW Time -- ID
VDD= –15V
VGS= –10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT14394


Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT14395


VGS – Qg
VDS= –15V
ID= –75A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT14396


A S O
IDP= –225A
ID= –75A
PW≤10μs
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
IT14397


PD -- Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
IT14398


EAS -- Ta
Avalanche Energy derating factor – %
Ambient Temperature, Ta – °C
IT10478

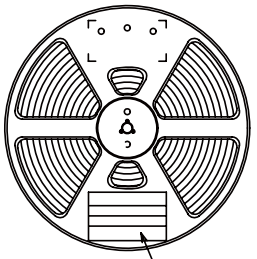
Taping Specification

ATP104-TL-H

1. Packing Format (TL)

Package Name	Carrier Tape Type	Maximum Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	INNER BOX SD-C-18	OUTER BOX SD-A-18
ATPAK	ATP	3,000	3,000	15,000	1 reels contained Dimensions:mm (external) 340×340×28	5 inner boxes contained Dimensions:mm (external) 355×355×165

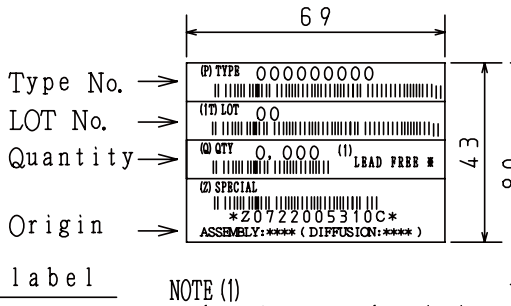
Packing method



Reel label

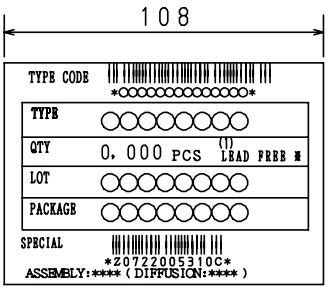
Reel label, Inner box label

(unit:mm)



Outer box label

It is a label at the time of factory shipments. The form of a label may change in physical distribution process.



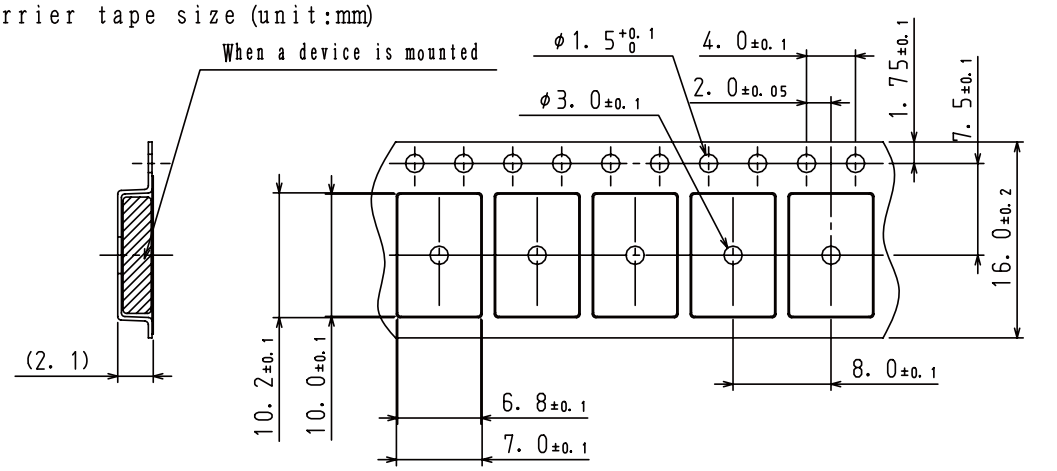
NOTE (1)

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

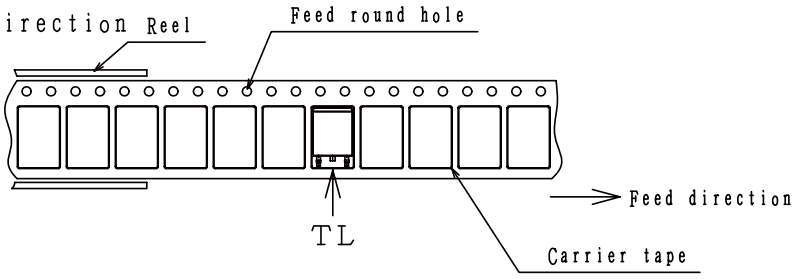
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

2-1. Carrier tape size (unit:mm)



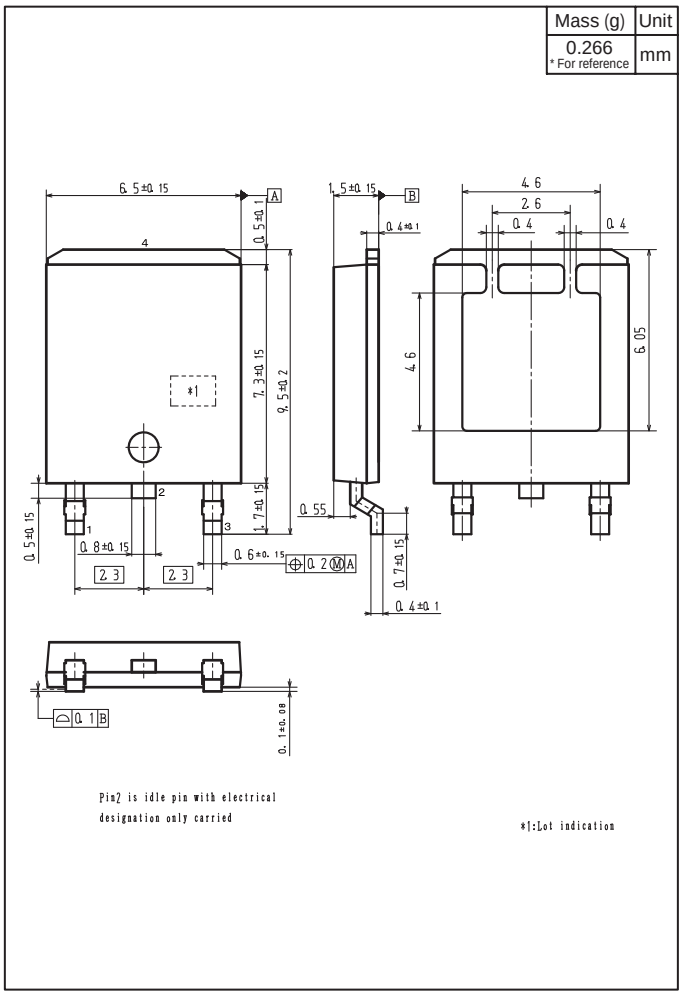
2-2. Device placement direction



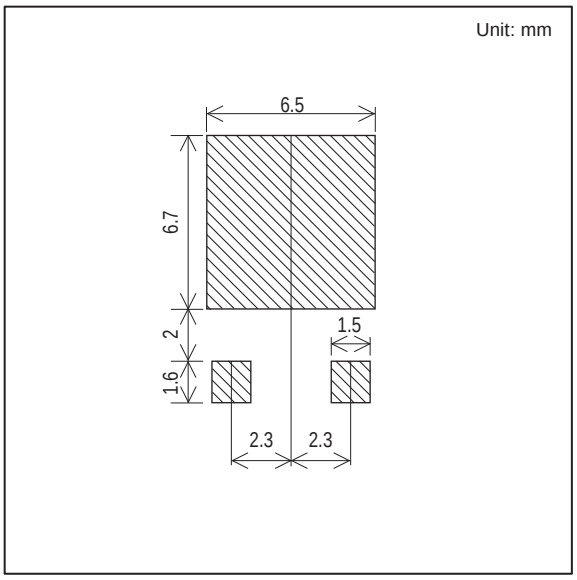
The one erectrode terminals on feed hole side····TL

Outline Drawing

ATP104-TL-H



Land Pattern Example



Note on usage : Since the ATP104 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.