Ordering number : ENA1405A

ATP404

N-Channel Power MOSFET
60V, 95A, 7.2mΩ, ATPAK

ON Semiconductor®
http://onsemi.com

Features

- ON-resistance $R_{DS}(on)1$=5.5mΩ (typ.)
- 4.5V drive
- Input capacitance Ciss=6400pF (typ.)
- Halogen free compliance

Specifications

Absolute Maximum Ratings at Ta=25°C

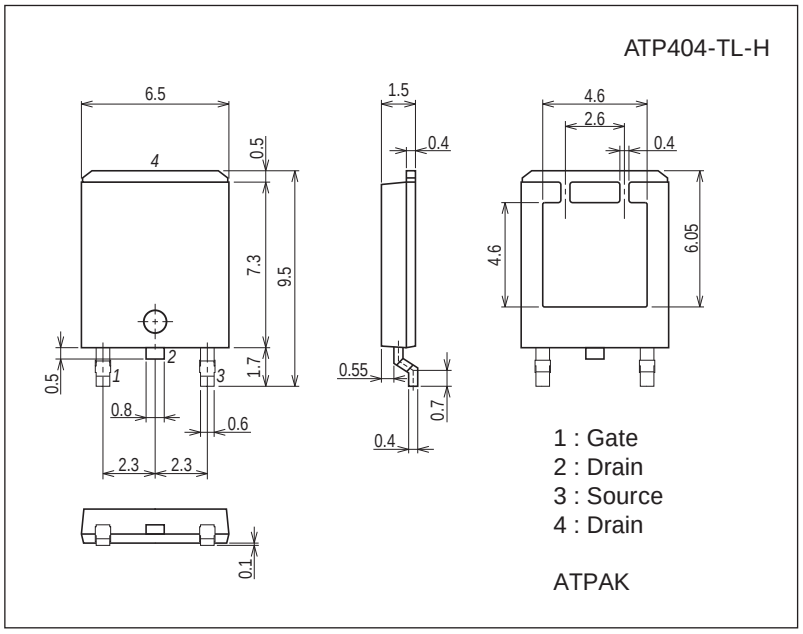
Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		60	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		95	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	380	A
Allowable Power Dissipation	P_D	Tc=25°C	70	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *1	E_{AS}		214	mJ
Avalanche Current *2	I_{AV}		48	A

Note :*1 V_{DD}=30V, L=100μH, I_{AV}=48A
*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

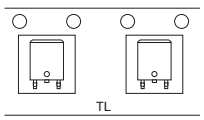
unit : mm (typ)
7057-001



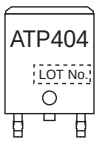
Product & Package Information

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

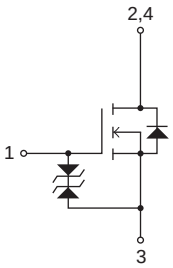
Packing Type: TL



Marking



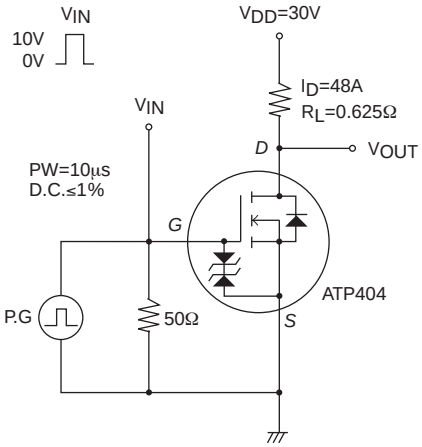
Electrical Connection



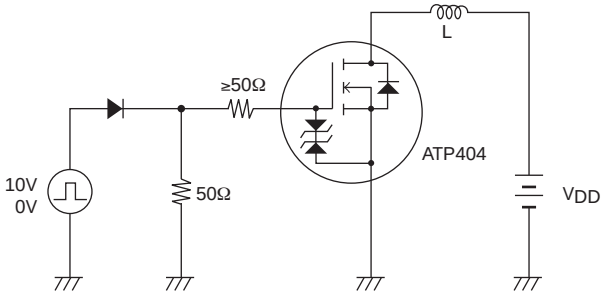
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	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=48A		100		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=48A, V_{GS}=10V		5.5	7.2	mΩ
	R_{DS}(on)2	I_D=48A, V_{GS}=4.5V		7.5	10.5	mΩ
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		6400		pF
Output Capacitance	Coss			490		pF
Reverse Transfer Capacitance	Crss			380		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		53		ns
Rise Time	t_r			640		ns
Turn-OFF Delay Time	t_d(off)			380		ns
Fall Time	t_f			520		ns
Total Gate Charge	Qg	V_{DS}=30V, V_{GS}=10V, I_D=95A		120		nC
Gate-to-Source Charge	Qgs			25		nC
Gate-to-Drain “Miller” Charge	Qgd			25		nC
Diode Forward Voltage	V_{SD}	I_S=95A, V_{GS}=0V		0.95	1.2	V

Switching Time Test Circuit

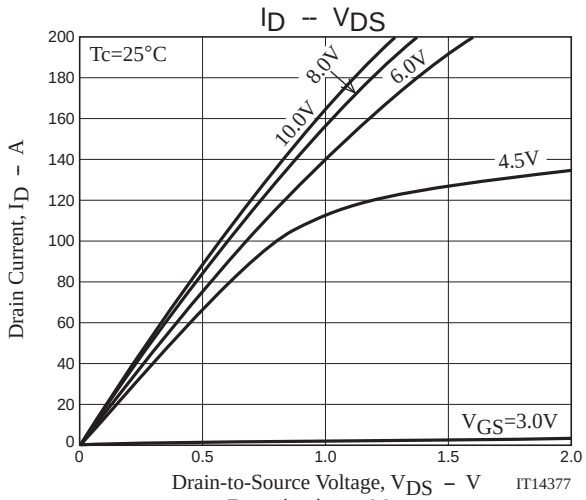


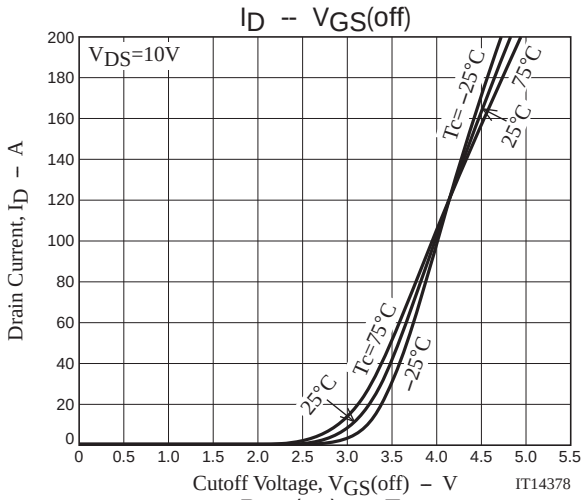
Avalanche Resistance Test Circuit

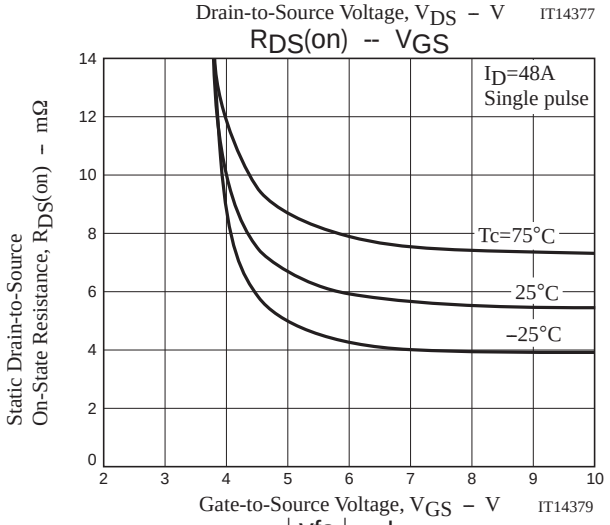


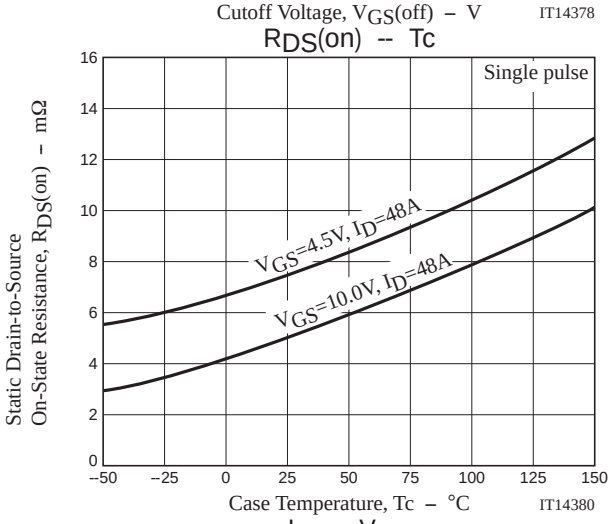
Ordering Information

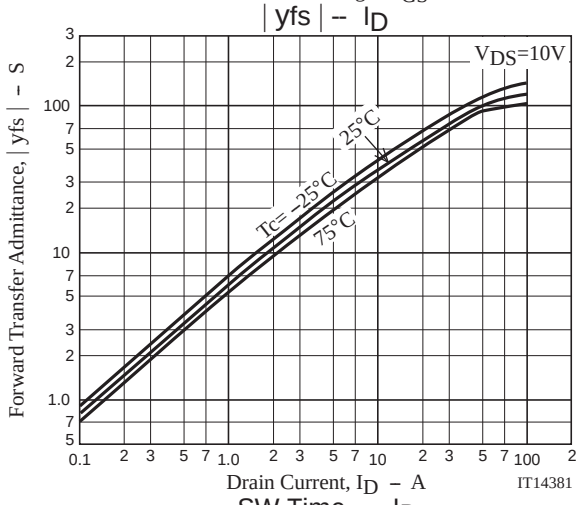
Device	Package	Shipping	memo
ATP404-TL-H	ATPAK	3,000pcs./reel	Pb Free and Halogen Free

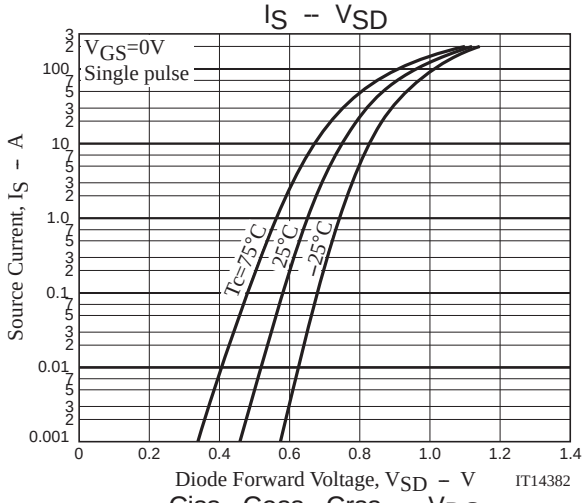

ID -- VDS
Tc=25°C
8.0V
10.0V
6.0V
4.5V
VGS=3.0V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT14377

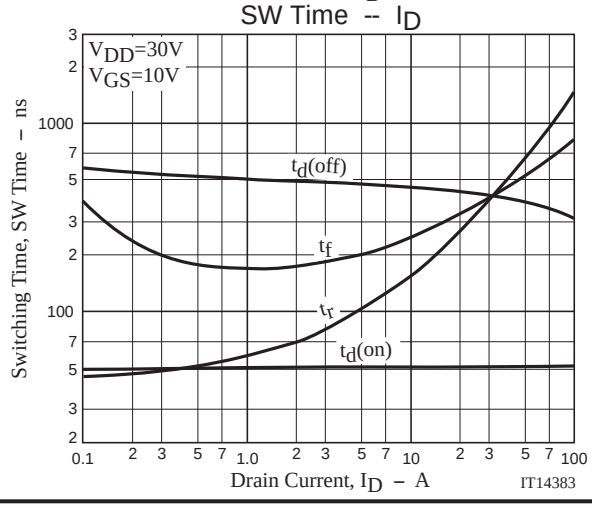

ID -- VGS(off)
VDS=10V
Tc=–25°C
25°C
75°C
Tc=75°C
25°C
–25°C
Drain Current, ID – A
Cutoff Voltage, VGS(off) – V
IT14378

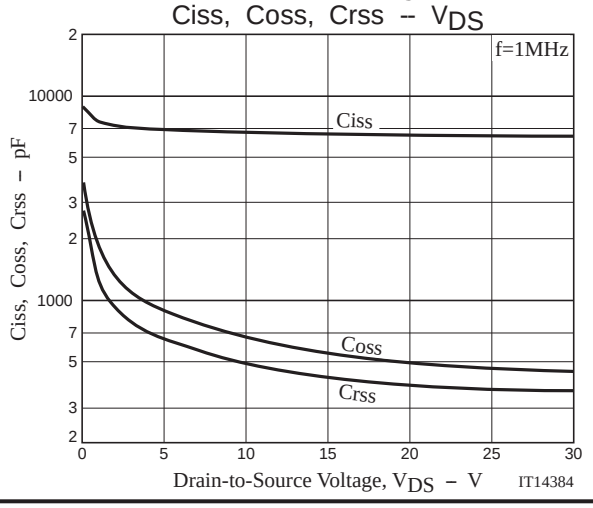

RDS(on) -- VGS
ID=48A
Single pulse
Tc=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT14379

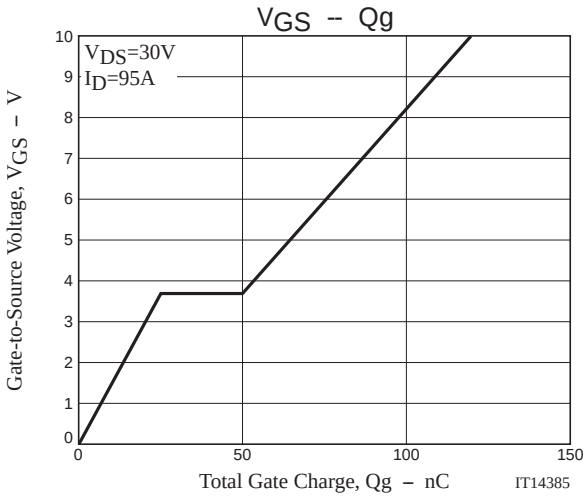

RDS(on) -- Tc
Single pulse
VGS=4.5V, ID=48A
VGS=10.0V, ID=48A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Case Temperature, Tc – °C
IT14380

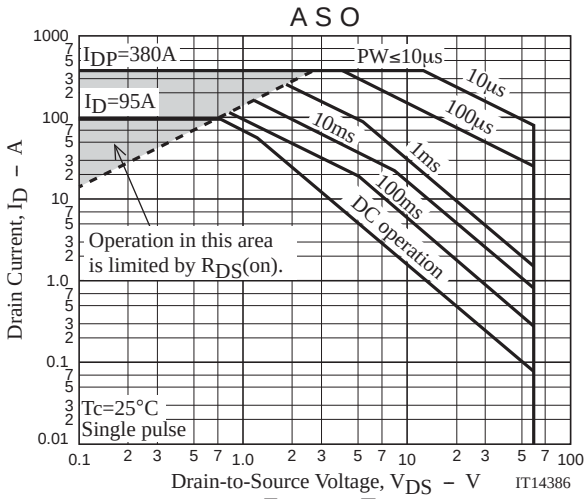

| yfs | -- ID
VDS=10V
25°C
Tc=–25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT14381

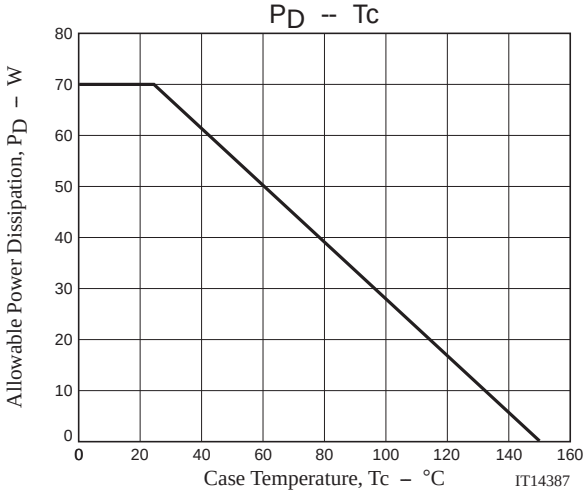

IS -- VSD
VGS=0V
Single pulse
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT14382

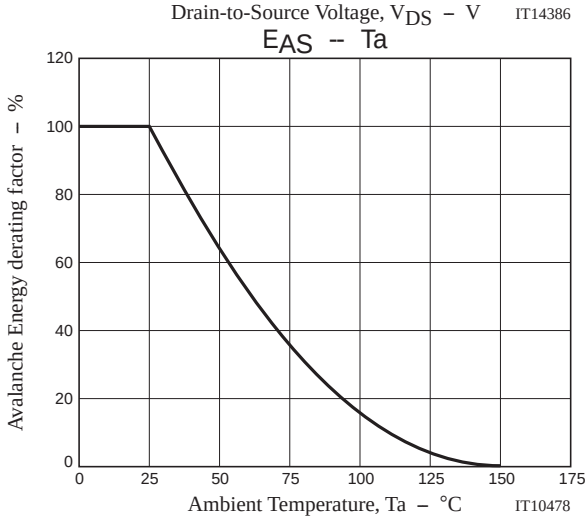

SW Time -- ID
VDD=30V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT14383


Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT14384


VGS – Qg
VDS=30V
ID=95A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT14385


A S O
IDP=380A
PW≤10μs
ID=95A
10μs
100μs
10ms
1ms
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
IT14386


PD -- Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
IT14387


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

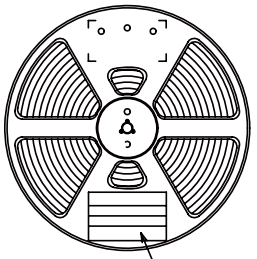
Taping Specification

ATP404-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

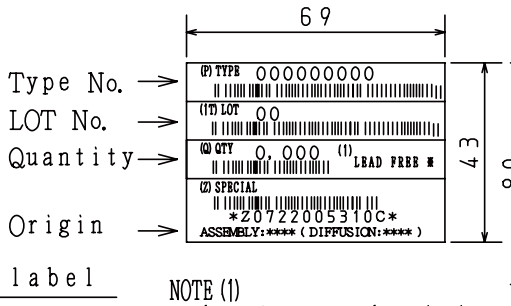
Packing method



Reel label

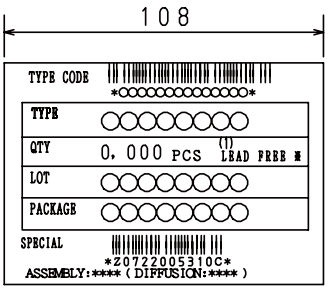
Reel label, Inner box label

(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.



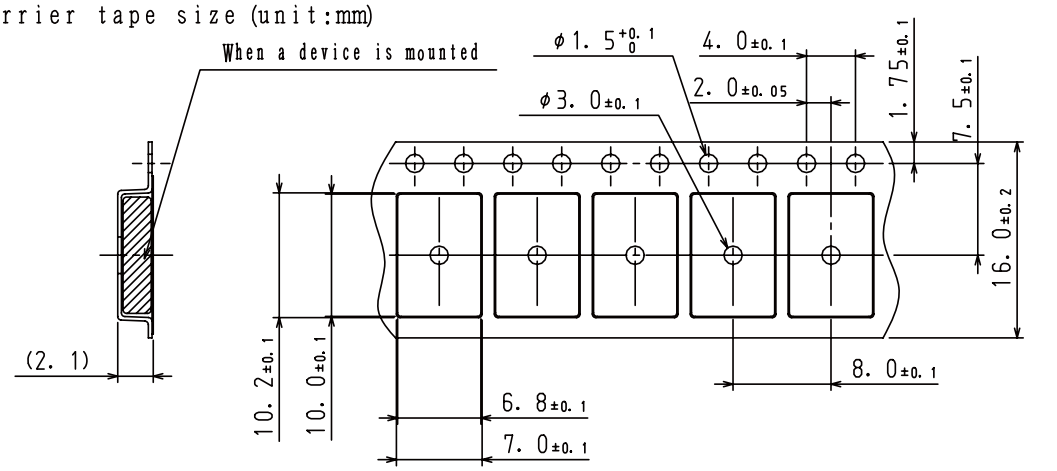
NOTE (1)

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

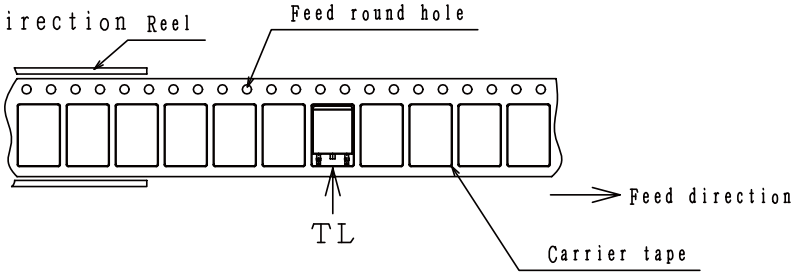
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



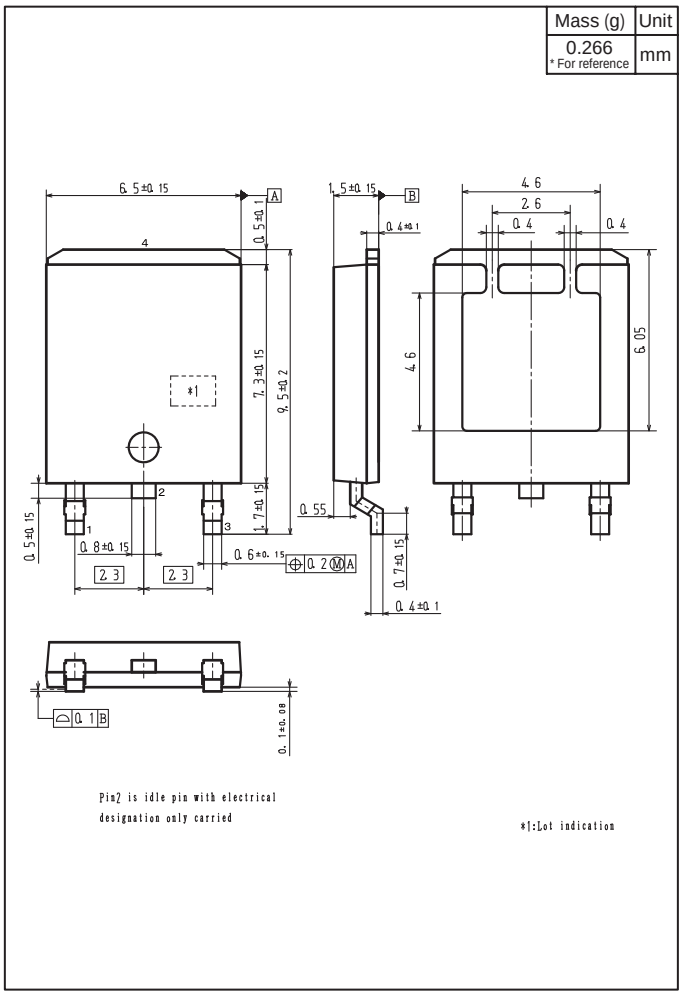
2-2. Device placement direction



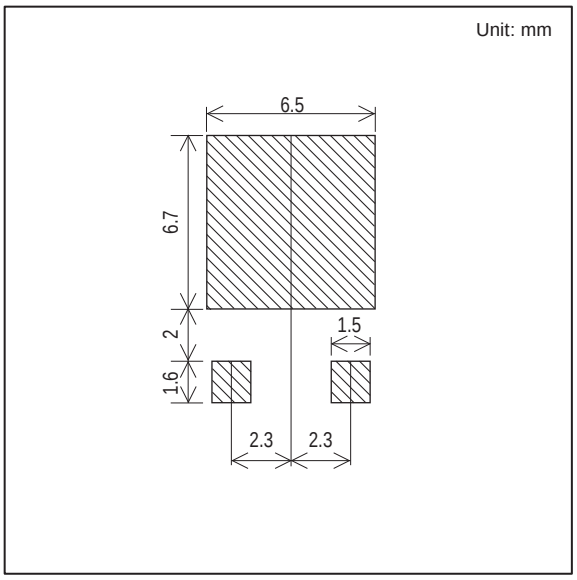
The one erectrode terminals on feed hole side····TL

Outline Drawing

ATP404-TL-H



Land Pattern Example



Note on usage : Since the ATP404 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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