



ATP613

N-Channel Power MOSFET 500V, 5.5A, 2Ω, ATPAK

ON Semiconductor®

<http://onsemi.com>

Features

- Reverse recovery time $t_{rr}=60\text{ns}(\text{typ.})$
- Input Capacitance $C_{iss}=350\text{pF}(\text{typ.})$
- Halogen free compliance
- ON-resistance $R_{DS(\text{on})}=1.55\Omega(\text{typ.})$
- 10V drive

Specifications

Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		500	V
Gate-to-Source Voltage	V_{GSS}		± 30	V
Drain Current (DC)	I_D		5.5	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	19	A
Source-to-Drain Diode Forward Current (DC)	I_S		5.5	A
Source-to-Drain Diode Forward Current (Pulse)	I_{SP}	$PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	19	A
Allowable Power Dissipation	P_D	$T_c=25^\circ\text{C}$	70	W
Channel Temperature	T_{ch}		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$
Avalanche Energy (Single Pulse) *1	E_{AS}		93	mJ
Avalanche Current *2	I_{AV}		5.5	A

Note : *1 $V_{DD}=99\text{V}$, $L=5\text{mH}$, $I_{AV}=5.5\text{A}$ (Fig.1)

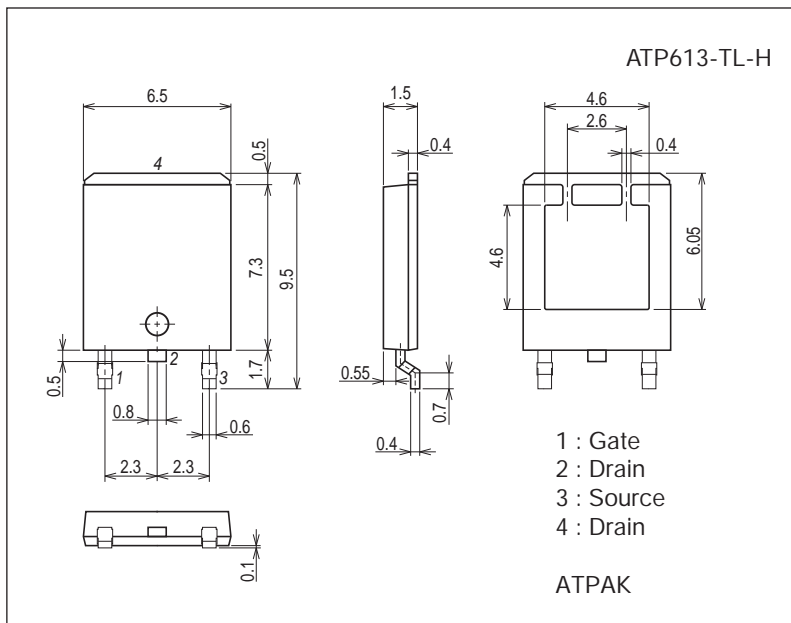
*2 $L \leq 5\text{mH}$, Single pulse

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)

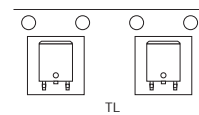
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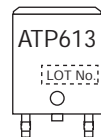
Product & Package Information

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

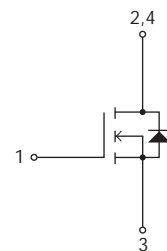
Packing Type: TL



Marking



Electrical Connection



ATP613

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit	
			min	typ	max		
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=10mA, V_{GS}=0V$	500			V	
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=400V, V_{GS}=0V$			100	μA	
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$			± 100	nA	
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10V, I_D=1mA$	3		5	V	
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10V, I_D=2.75A$	1.5	2.9		S	
Static Drain-to-Source On-State Resistance	$R_{DS(on)}$	$I_D=2.75A, V_{GS}=10V$		1.55	2.0	Ω	
Input Capacitance	C_{iss}	$V_{DS}=30V, f=1MHz$		350		pF	
Output Capacitance	C_{oss}				68		pF
Reverse Transfer Capacitance	C_{rss}				15		pF
Turn-ON Delay Time	$t_{d(on)}$	See Fig.2		14.2		ns	
Rise Time	t_r				46		ns
Turn-OFF Delay Time	$t_{d(off)}$				37.6		ns
Fall Time	t_f				20.4		ns
Total Gate Charge	Q_g	$V_{DS}=200V, V_{GS}=10V, I_D=5.5A$		13.8		nC	
Gate-to-Source Charge	Q_{gs}				3.2		nC
Gate-to-Drain "Miller" Charge	Q_{gd}				7.6		nC
Diode Forward Voltage	V_{SD}	$I_S=5.5A, V_{GS}=0V$		1.1	1.5	V	
Reverse Recovery Time	t_{rr}	See Fig.3		60		ns	
Reverse Recovery Charge	Q_{rr}	$I_S=5.5A, V_{GS}=0V, di/dt=100A/\mu s$		120		nC	

Fig.1 Unclamped Inductive Switching Test Circuit

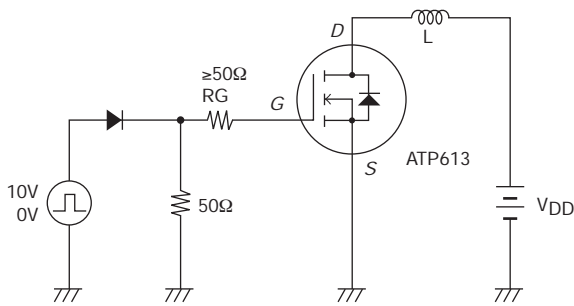


Fig.2 Switching Time Test Circuit

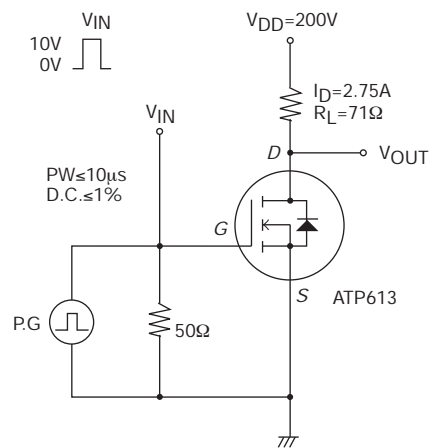
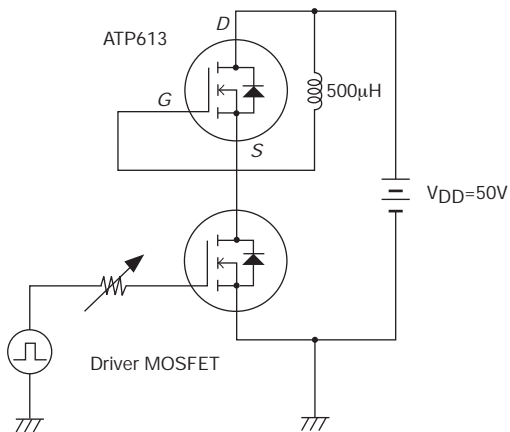
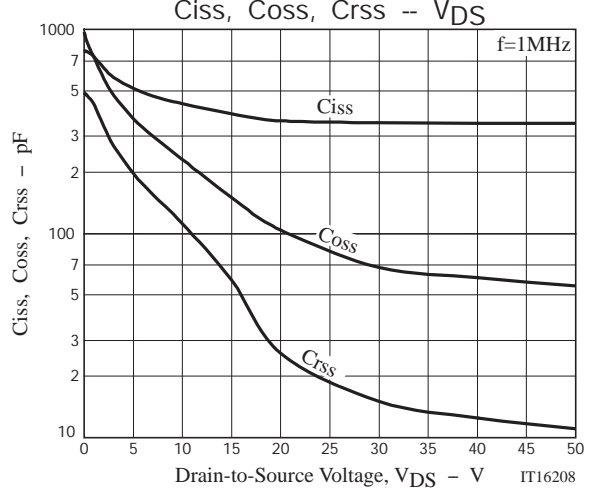
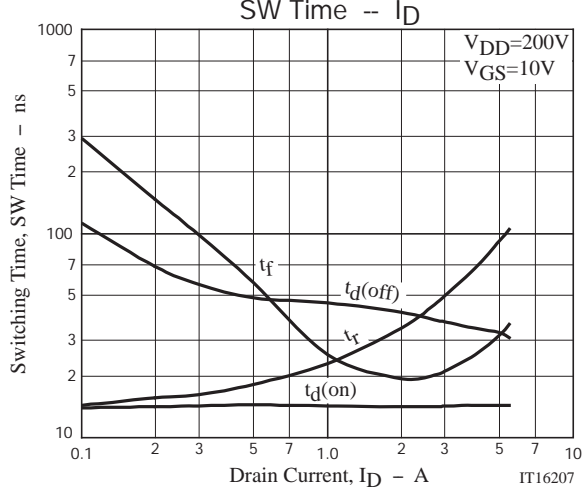
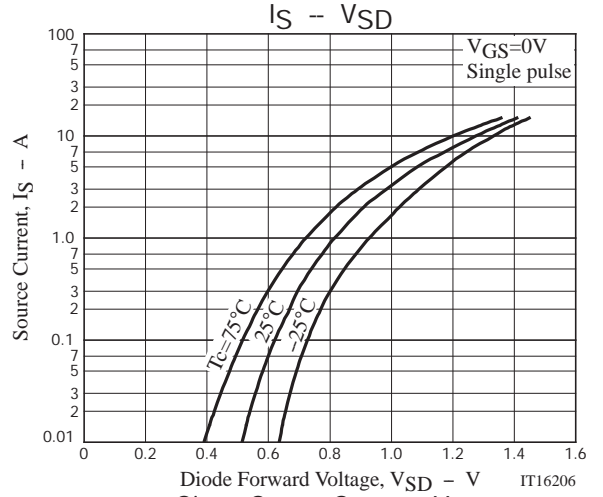
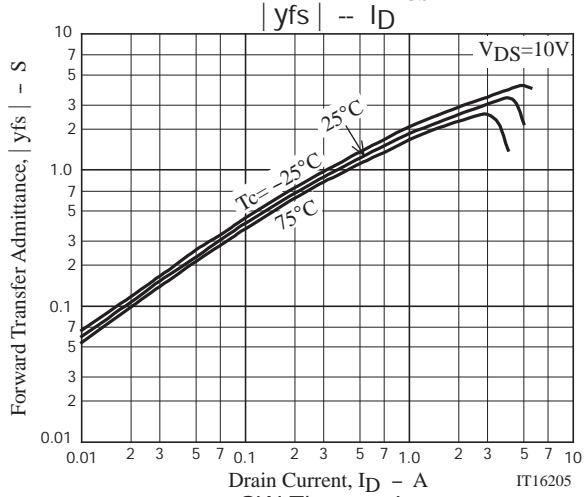
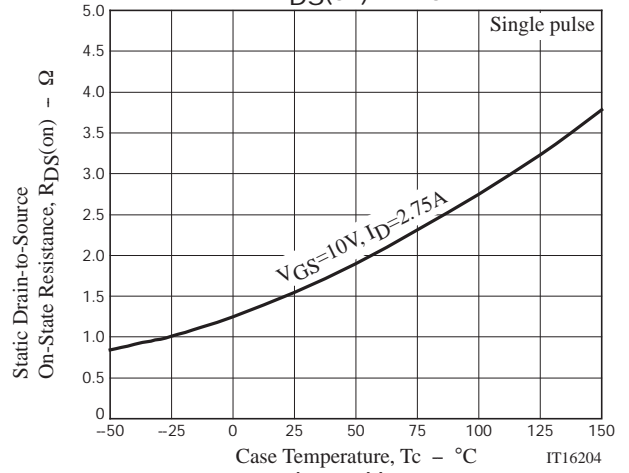
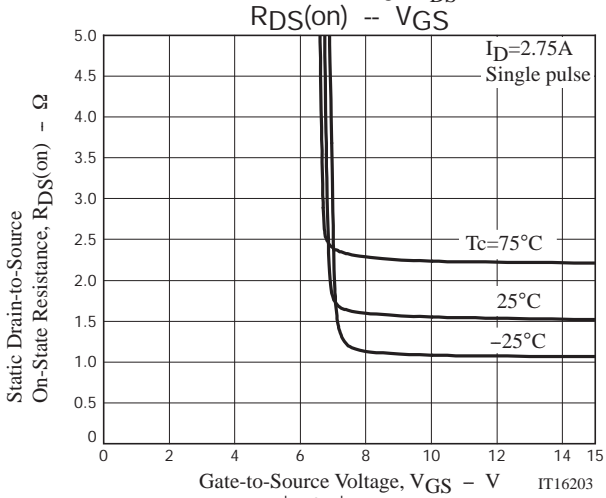
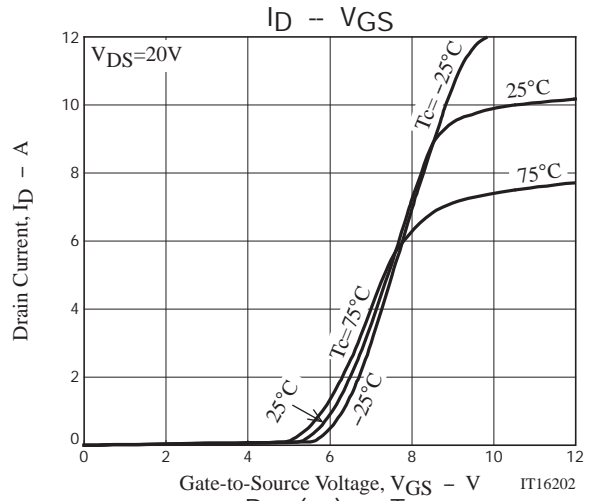
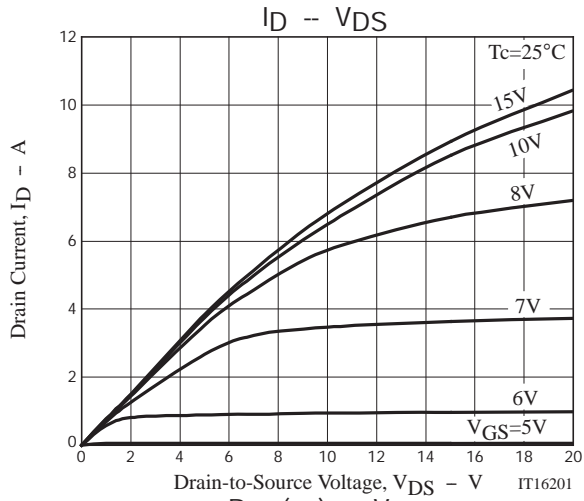


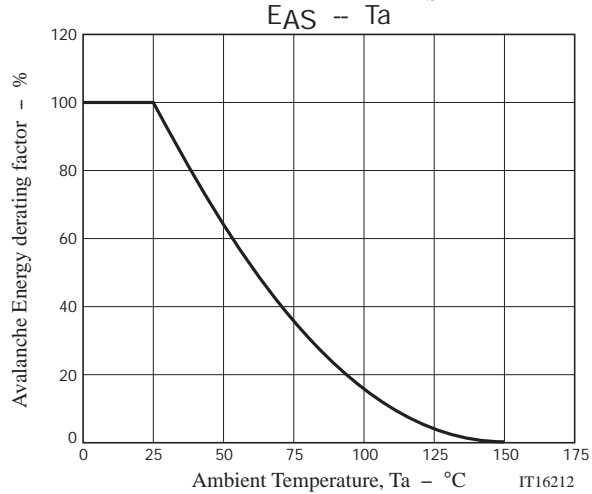
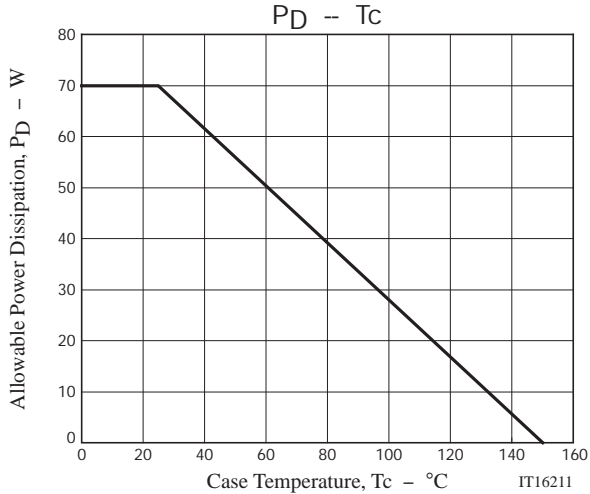
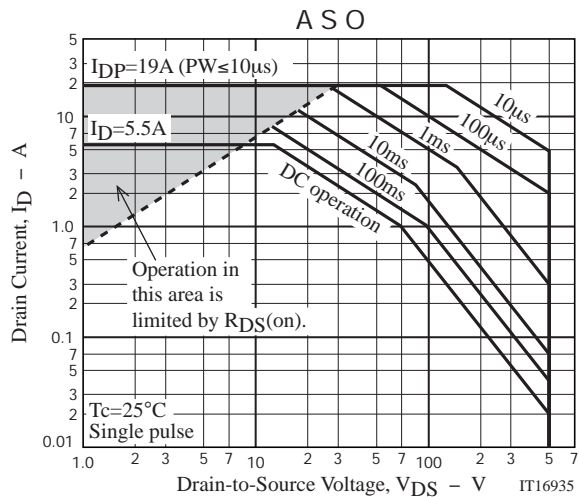
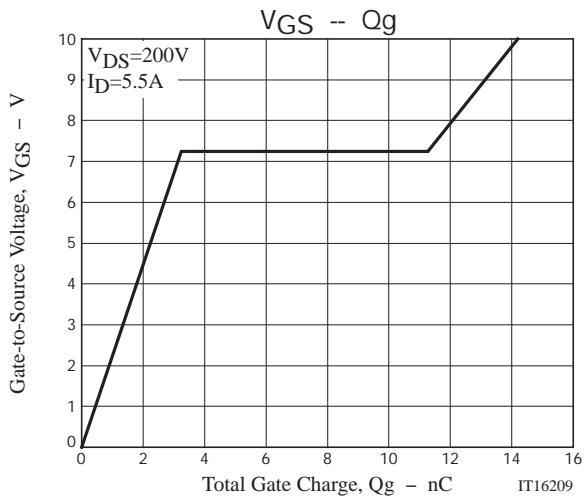
Fig.3 Reverse Recovery Time Test Circuit



Ordering Information

Device	Package	Shipping	memo
ATP613-TL-H	ATPAK	3,000pcs./reel	Pb Free and Halogen Free





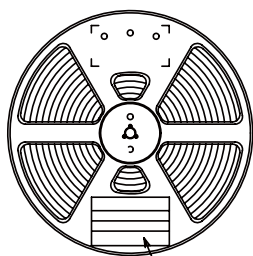
Taping Specification

ATP613-TL-H

1. Packing Format (TL)

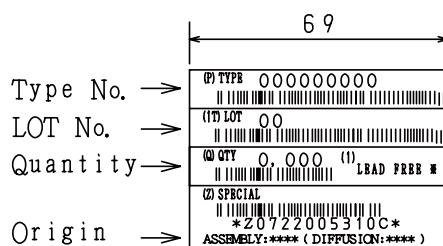
Package Name	Carrier Tape Type	Maximum Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	INNER BOX SD-C-18	OUTER BOX SD-A-18
ATPAK	ATP	3,000	3,000	15,000	1 reels contained Dimensions:mm (external) 340×340×28	5 inner boxes contained Dimensions:mm (external) 355×355×165

Packing method



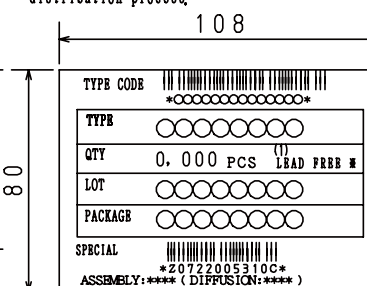
Reel label

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.



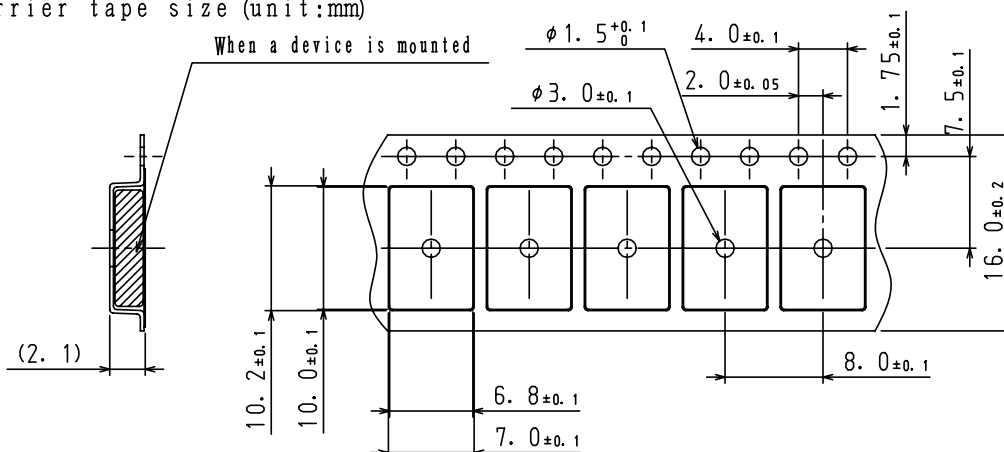
NOTE (1)

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

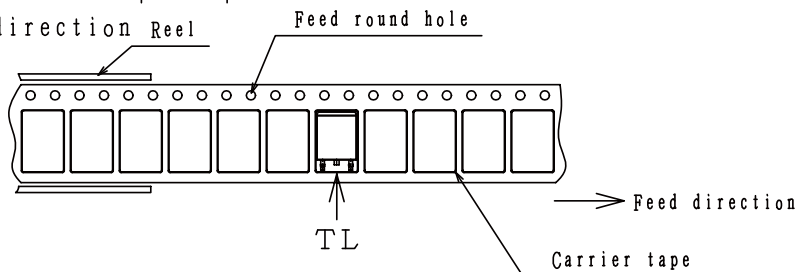
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



2-2. Device placement direction Reel



The one electrode terminals on feed hole side...TL

ATP613

Outline Drawing

ATP613-TL-H



Land Pattern Example



Note on usage : Since the ATP613 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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