Ordering number : ENA1507

SANYO Semiconductors
DATA SHEET

N-Channel Silicon MOSFET

# ATP212 — General-Purpose Switching Device Applications

## Features

- Low ON-resistance.
- Large current.
- Slim package.
- 4V drive.
- 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) | $I_D$ | | 35 | A |
| Drain Current (PW≤10μs) | $I_{DP}$ | PW≤10μs, duty cycle≤1% | 105 | A |
| Allowable Power Dissipation | $P_D$ | Tc=25°C | 40 | W |
| Channel Temperature | Tch | | 150 | °C |
| Storage Temperature | Tstg | | −55 to +150 | °C |
| Avalanche Energy (Single Pulse) *1 | $E_{AS}$ | | 19 | mJ |
| Avalanche Current *2 | $I_{AV}$ | | 18 | A |

Note :*1 $V_{DD}$=10V, L=100μH, $I_{AV}$=18A
*2 L≤100μH, Single pulse

### 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 | | | 1 | μA |
| Gate-to-Source Leakage Current | $I_{GSS}$ | $V_{GS}$=±16V, $V_{DS}$=0V | | | ±10 | μA |

Marking : ATP212

Continued on next page.

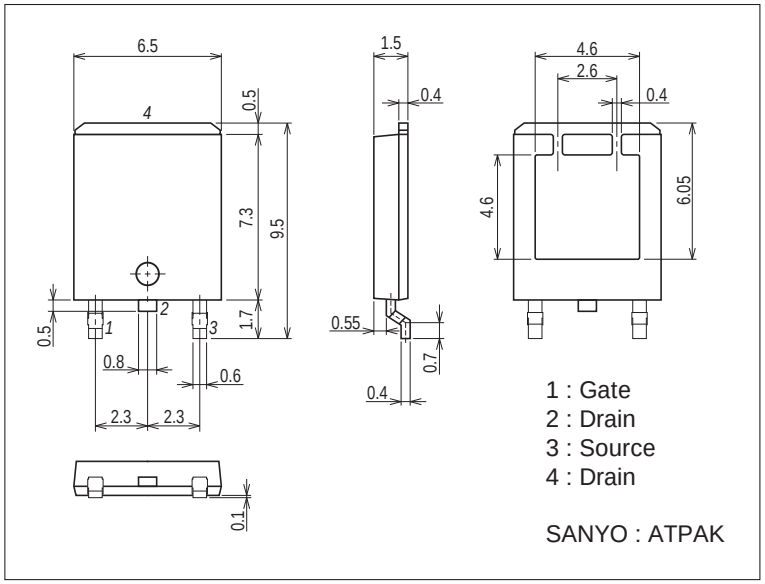
Continued from preceding page.

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Cutoff Voltage | $V_{GS}$(off) | $V_{DS}$=10V, $I_D$=1mA | 1.2 | | 2.6 | V |
| Forward Transfer Admittance | \| yfs \| | $V_{DS}$=10V, $I_D$=18A | | 35 | | S |
| Static Drain-to-Source On-State Resistance | $R_{DS}$(on)1 | $I_D$=18A, $V_{GS}$=10V | | 17 | 23 | mΩ |
| | $R_{DS}$(on)2 | $I_D$=9A, $V_{GS}$=4.5V | | 23 | 33 | mΩ |
| | $R_{DS}$(on)3 | $I_D$=5A, $V_{GS}$=4V | | 25 | 37 | mΩ |
| Input Capacitance | Ciss | $V_{DS}$=20V, f=1MHz | | 1820 | | pF |
| Output Capacitance | Coss | $V_{DS}$=20V, f=1MHz | | 150 | | pF |
| Reverse Transfer Capacitance | Crss | $V_{DS}$=20V, f=1MHz | | 100 | | pF |
| Turn-ON Delay Time | $t_d$(on) | See specified Test Circuit. | | 16 | | ns |
| Rise Time | $t_r$ | See specified Test Circuit. | | 110 | | ns |
| Turn-OFF Delay Time | $t_d$(off) | See specified Test Circuit. | | 125 | | ns |
| Fall Time | $t_f$ | See specified Test Circuit. | | 87 | | ns |
| Total Gate Charge | Qg | $V_{DS}$=30V, $V_{GS}$=10V, $I_D$=35A | | 34.5 | | nC |
| Gate-to-Source Charge | Qgs | $V_{DS}$=30V, $V_{GS}$=10V, $I_D$=35A | | 6.5 | | nC |
| Gate-to-Drain “Miller” Charge | Qgd | $V_{DS}$=30V, $V_{GS}$=10V, $I_D$=35A | | 6.8 | | nC |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=35A, $V_{GS}$=0V | | 0.96 | 1.2 | V |

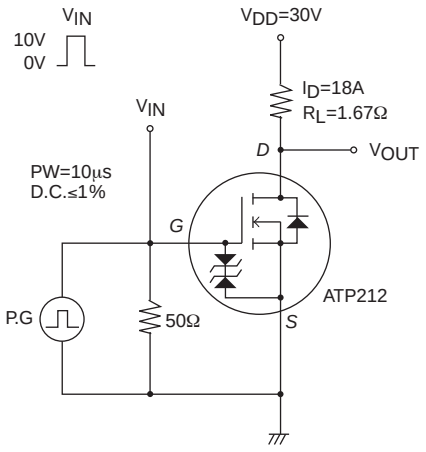
## Package Dimensions

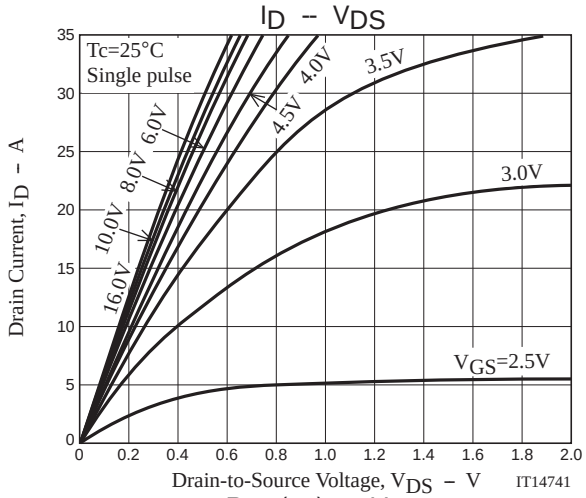
unit : mm (typ)

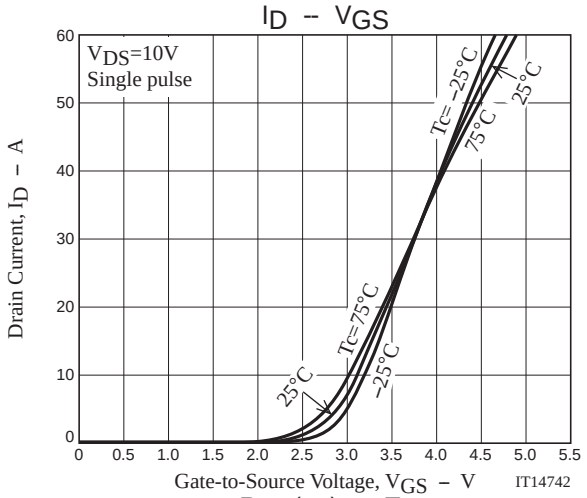
7057-001

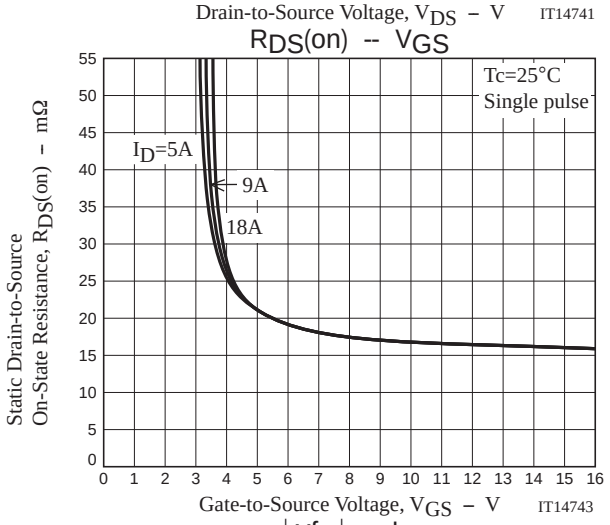


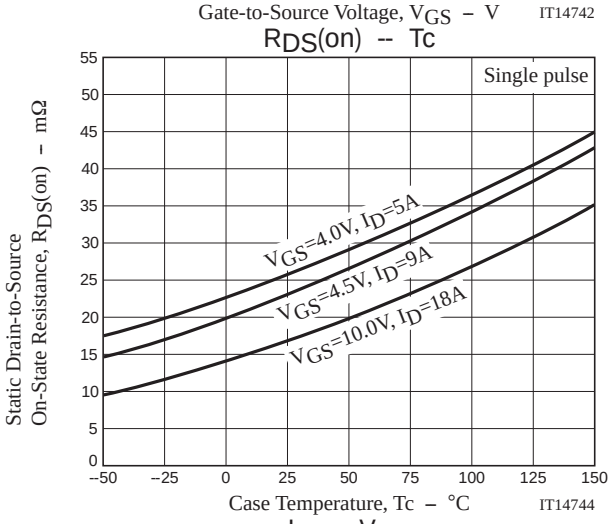

## Switching Time Test Circuit

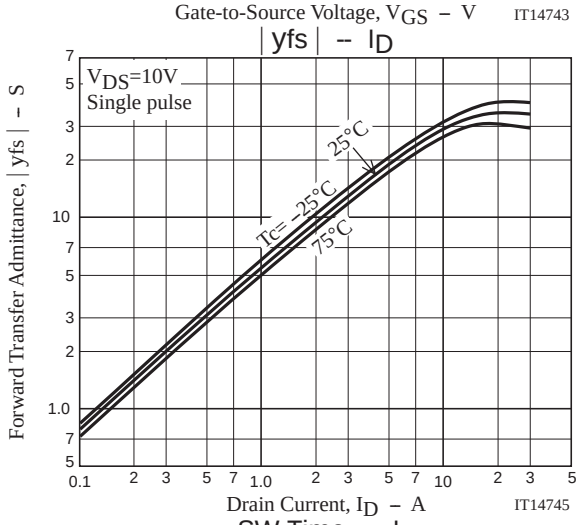


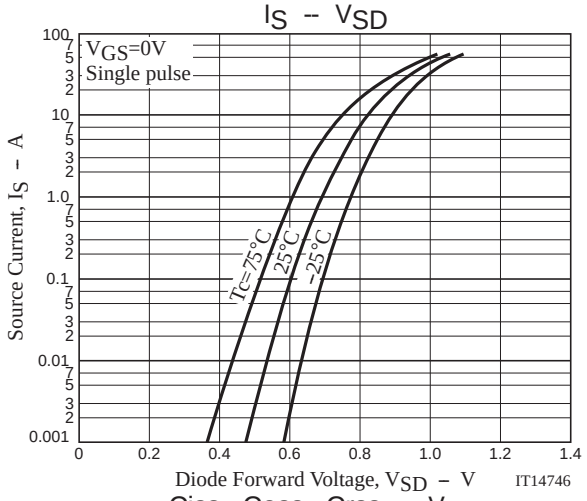

ID -- VDS
Tc=25°C
Single pulse
3.5V
4.0V
4.5V
6.0V
8.0V
10.0V
16.0V
3.0V
VGS=2.5V
Drain Current, ID - A
Drain-to-Source Voltage, VDS - V
IT14741

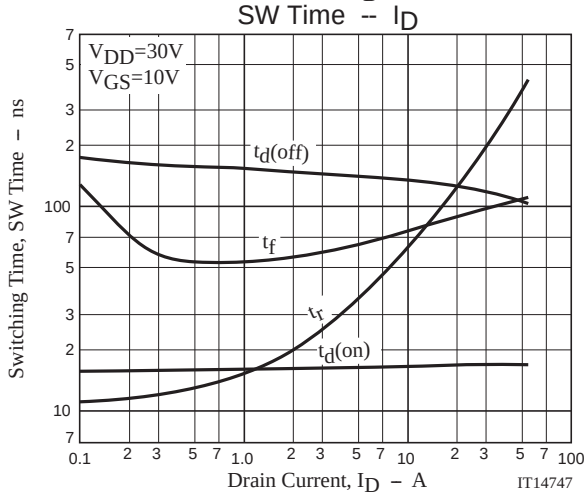

ID -- VGS
VDS=10V
Single pulse
Tc=-25°C
75°C
25°C
Tc=75°C
25°C
-25°C
Drain Current, ID - A
Gate-to-Source Voltage, VGS - V
IT14742

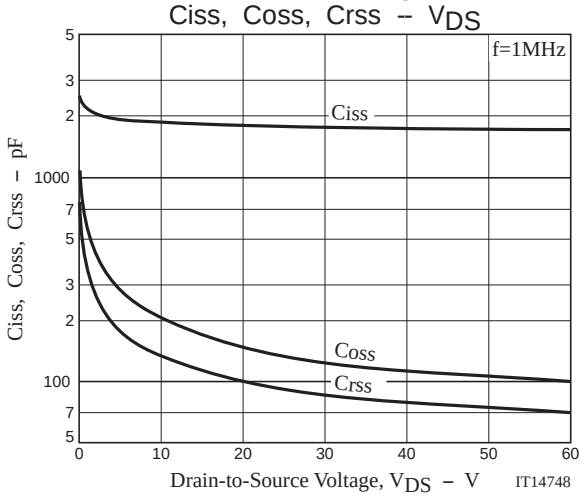

RDS(on) -- VGS
Tc=25°C
Single pulse
ID=5A
9A
18A
Static Drain-to-Source
On-State Resistance, RDS(on) - mΩ
Gate-to-Source Voltage, VGS - V
IT14743

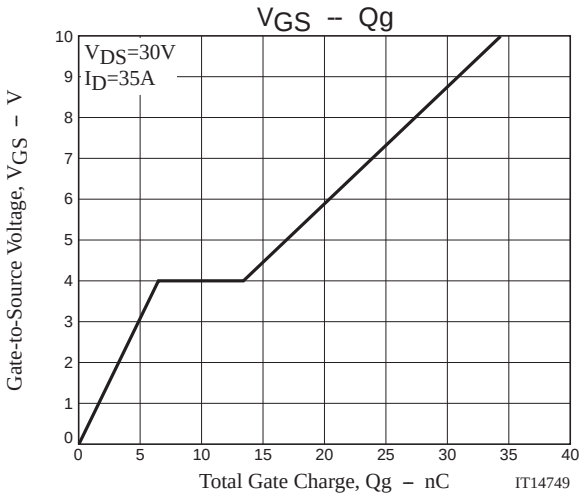

RDS(on) -- Tc
Single pulse
VGS=4.0V, ID=5A
VGS=4.5V, ID=9A
VGS=10.0V, ID=18A
Static Drain-to-Source
On-State Resistance, RDS(on) - mΩ
Case Temperature, Tc - °C
IT14744

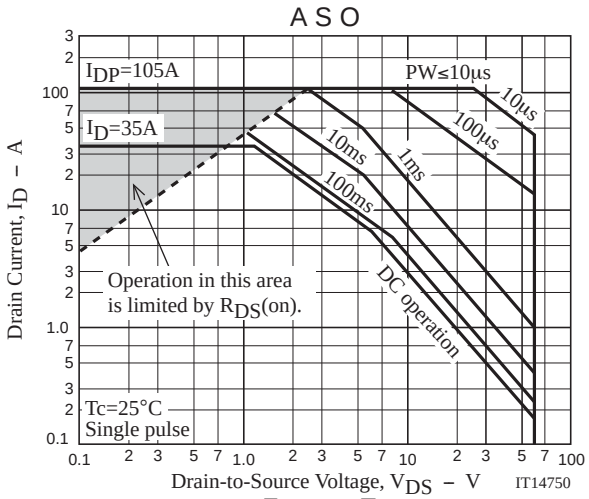

| yfs | -- ID
VDS=10V
Single pulse
25°C
Tc=-25°C
75°C
Forward Transfer Admittance, | yfs | - S
Drain Current, ID - A
IT14745

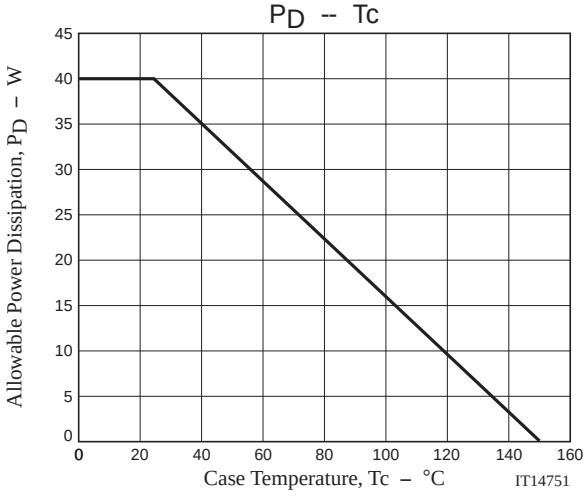

IS -- VSD
VGS=0V
Single pulse
Tc=75°C
25°C
-25°C
Source Current, IS - A
Diode Forward Voltage, VSD - V
IT14746

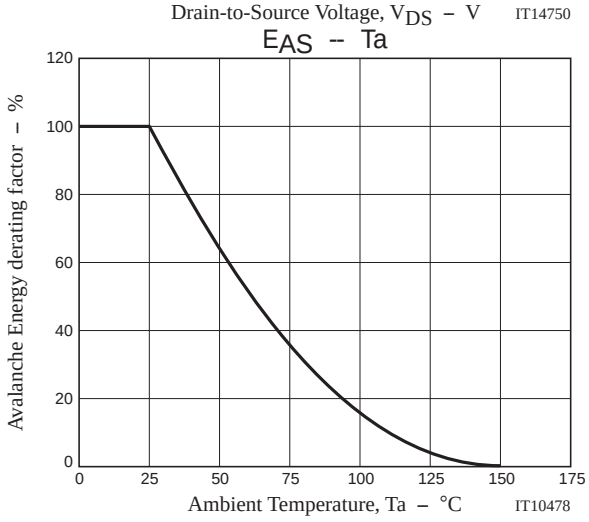

SW Time -- ID
VDD=30V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time - ns
Drain Current, ID - A
IT14747


Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss - pF
Drain-to-Source Voltage, VDS - V
IT14748




Note on usage : Since the ATP212 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.