Ordering number : ENA1543

SANYO Semiconductors
DATA SHEET

An ON Semiconductor Company

N-Channel Silicon MOSFET

ATP602 — General-Purpose Switching Device Applications

Features

- High-speed switching.
- 10V drive.
- Avalanche resistance guarantee.
- Halogen free compliance.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		600	V
Gate-to-Source Voltage	V_{GSS}		±30	V
Drain Current (DC)	I_D		5	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	15	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}		74	mJ
Avalanche Current *2	I_{AV}		5	A

Note :*1 V_{DD}=99V, L=5mH, I_{AV}=5A
*2 L≤5mH, 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=10mA, V_{GS}=0V	600			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=480V, V_{GS}=0V			100	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±30V, V_{DS}=0V			±100	nA

Marking : ATP602

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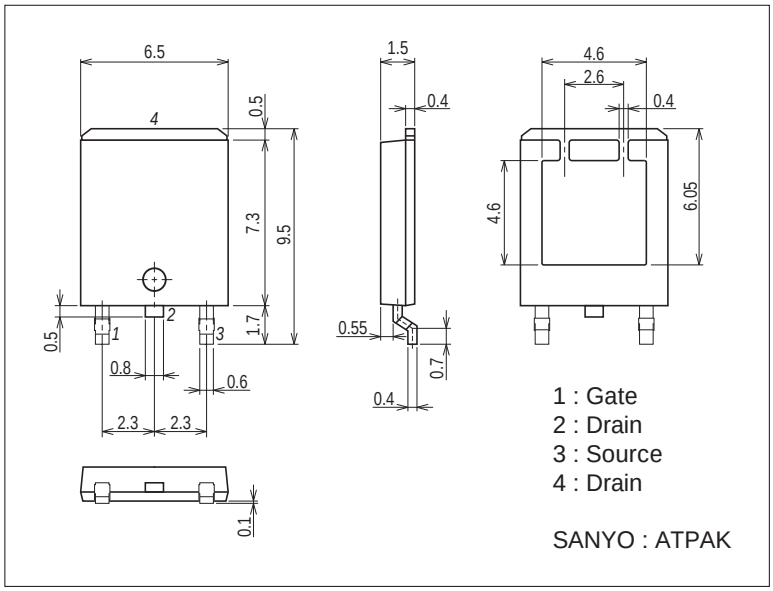
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	3		5	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=2.5A	1.5	2.9		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)	I_D=2.5A, V_{GS}=10V		2.1	2.7	Ω
Input Capacitance	Ciss	V_{DS}=30V, f=1MHz		350		pF
Output Capacitance	Coss	V_{DS}=30V, f=1MHz		68		pF
Reverse Transfer Capacitance	Crss	V_{DS}=30V, f=1MHz		15		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		14.2		ns
Rise Time	t_r	See specified Test Circuit.		37.4		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		36.2		ns
Fall Time	t_f	See specified Test Circuit.		20.4		ns
Total Gate Charge	Qg	V_{DS}=200V, V_{GS}=10V, I_D=5A		13.6		nC
Gate-to-Source Charge	Qgs	V_{DS}=200V, V_{GS}=10V, I_D=5A		3.4		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=200V, V_{GS}=10V, I_D=5A		7.2		nC
Diode Forward Voltage	V_{SD}	I_S=5A, V_{GS}=0V		0.9	1.2	V

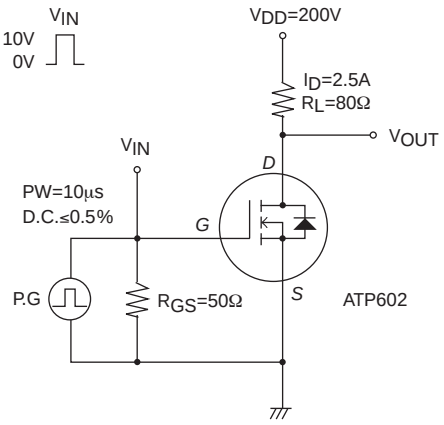
Package Dimensions

unit : mm (typ)

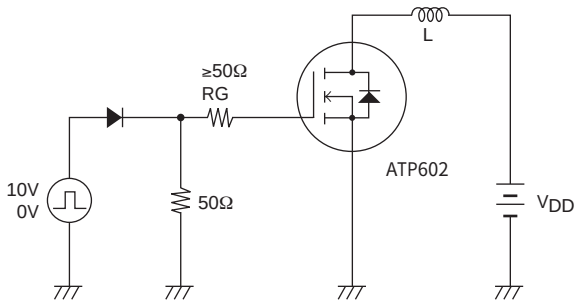
7057-001

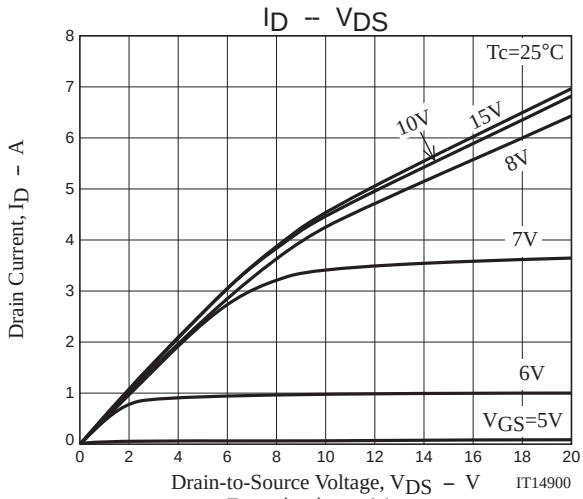


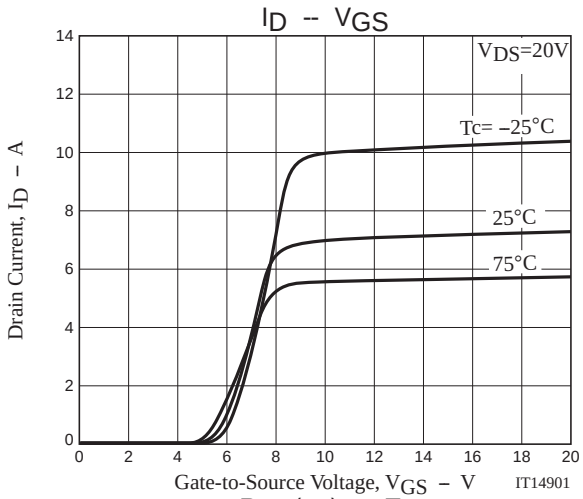
Switching Time Test Circuit

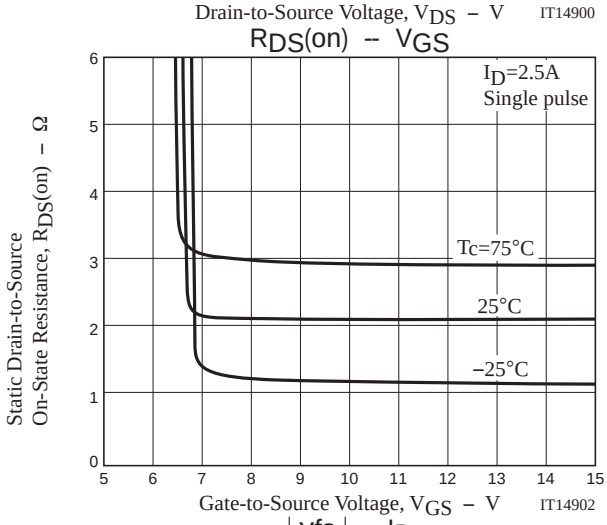


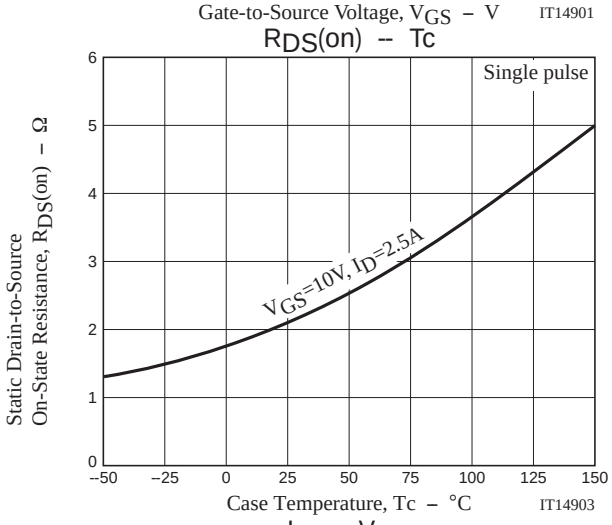
Avalanche Resistance Test Circuit

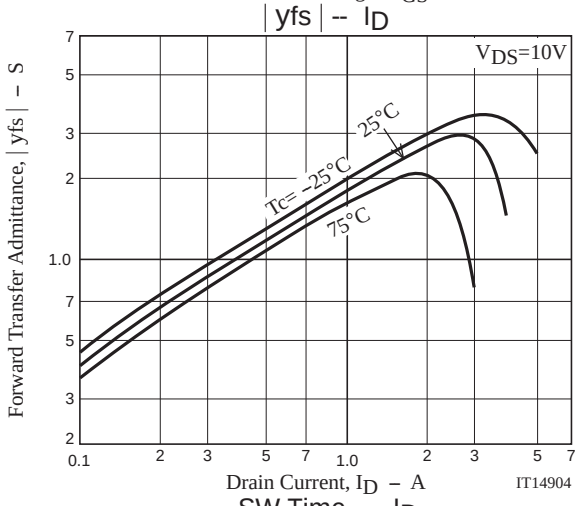


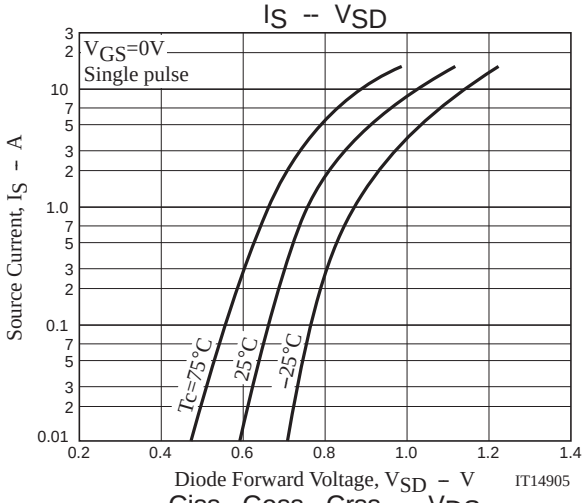

ID -- VDS
Tc=25°C
10V
15V
8V
7V
6V
VGS=5V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT14900

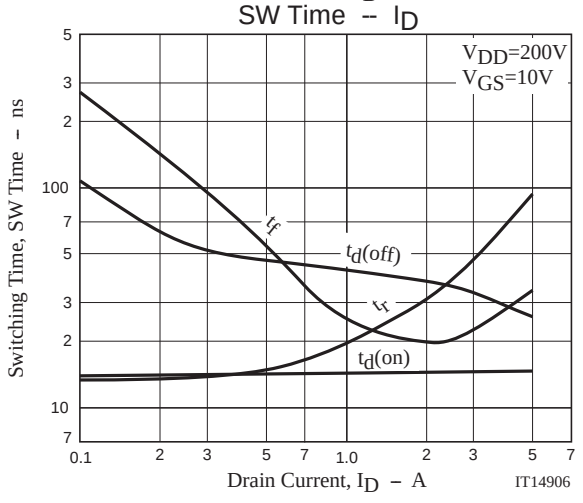

ID -- VGS
VDS=20V
Tc= –25°C
25°C
75°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT14901

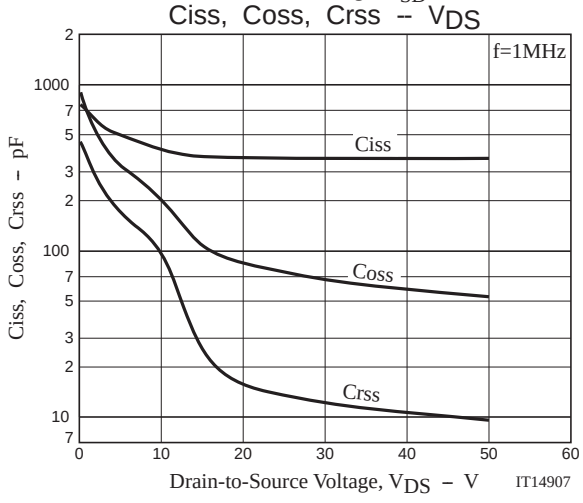

RDS(on) -- VGS
ID=2.5A
Single pulse
Tc=75°C
25°C
–25°C
Static Drain-to-Source
On-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V
IT14902

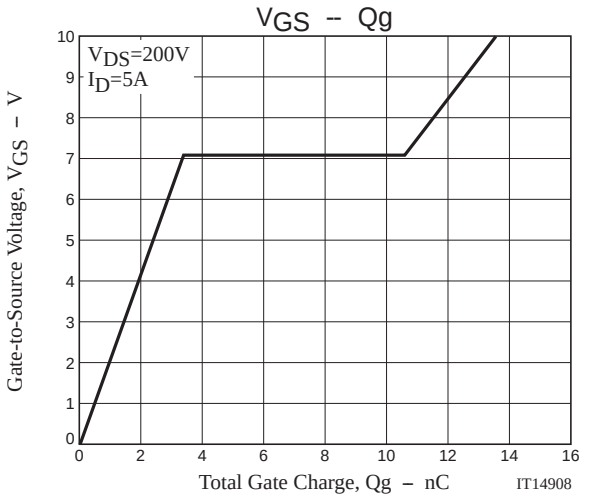

RDS(on) -- Tc
Single pulse
VGS=10V, ID=2.5A
Static Drain-to-Source
On-State Resistance, RDS(on) – Ω
Case Temperature, Tc – °C
IT14903

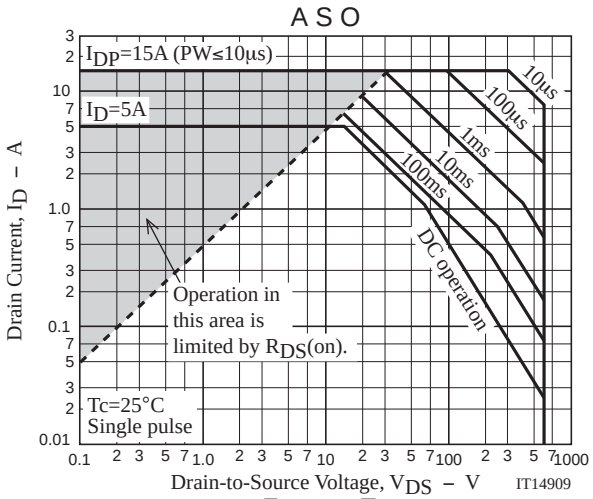

| yfs | -- ID
VDS=10V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT14904

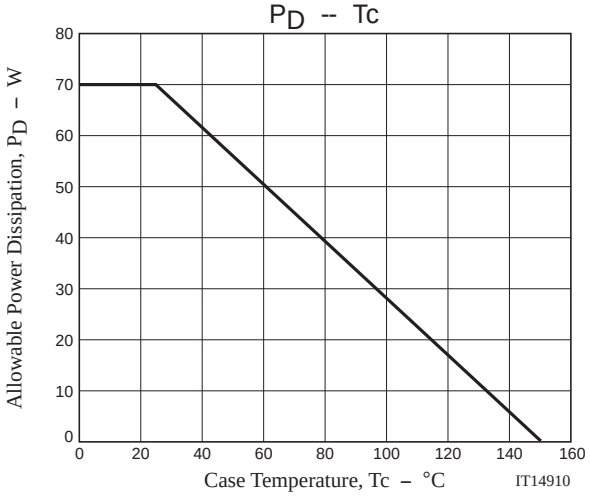

IS -- VSD
VGS=0V
Single pulse
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT14905

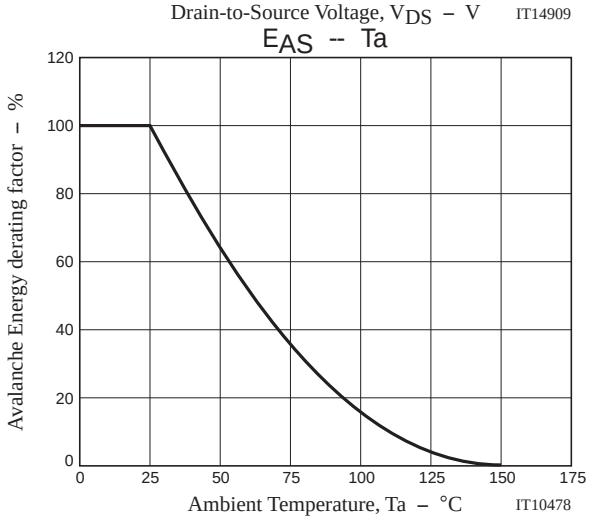

SW Time -- ID
VDD=200V
VGS=10V
tf
td(off)
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT14906


Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT14907









Note on usage : Since the ATP602 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.