Ordering number : ENA1458

SANYO Semiconductors
DATA SHEET

N-Channel Silicon MOSFET

ATP405 — General-Purpose Switching Device Applications

Features

- 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}		100	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		40	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	160	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}		148	mJ
Avalanche Current *2	I_{AV}		40	A

Note :*1 V_{DD}=30V, L=100μH, I_{AV}=40A
*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	100			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V, 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	2.0		3.5	V

Marking : ATP405

Continued on next page.

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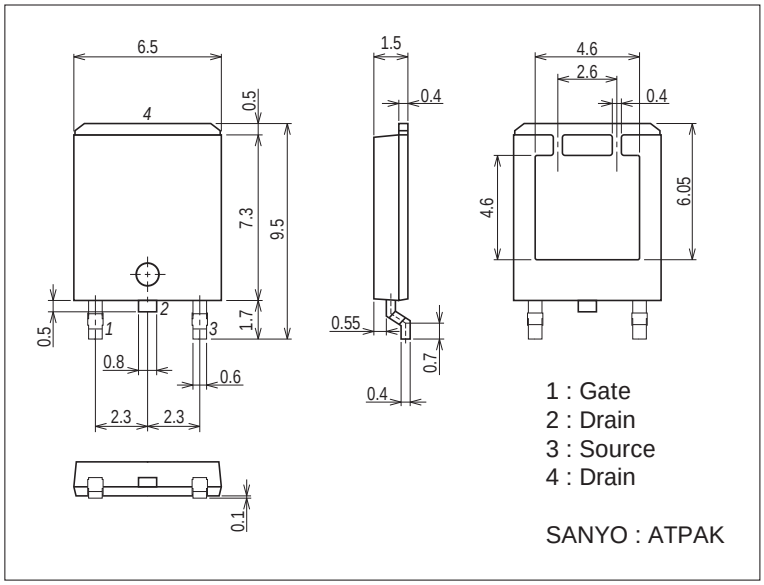
Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=20A		62		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)	I_D=20A, V_{GS}=10V		25	33	mΩ
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		4000		pF
Output Capacitance	Coss	V_{DS}=20V, f=1MHz		300		pF
Reverse Transfer Capacitance	Crss	V_{DS}=20V, f=1MHz		170		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		38		ns
Rise Time	t_r	See specified Test Circuit.		125		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		220		ns
Fall Time	t_f	See specified Test Circuit.		150		ns
Total Gate Charge	Qg	V_{DS}=60V, V_{GS}=10V, I_D=40A		68		nC
Gate-to-Source Charge	Qgs	V_{DS}=60V, V_{GS}=10V, I_D=40A		14		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=60V, V_{GS}=10V, I_D=40A		15		nC
Diode Forward Voltage	V_{SD}	I_S=40A, V_{GS}=0V		0.9	1.2	V

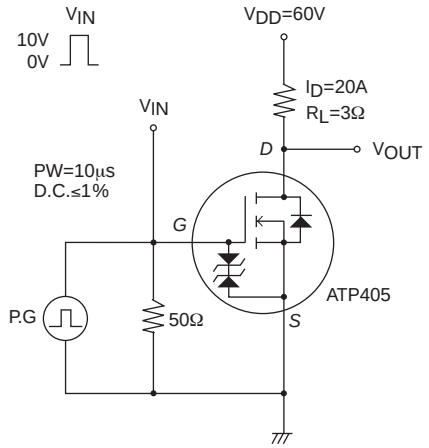
Package Dimensions

unit : mm (typ)

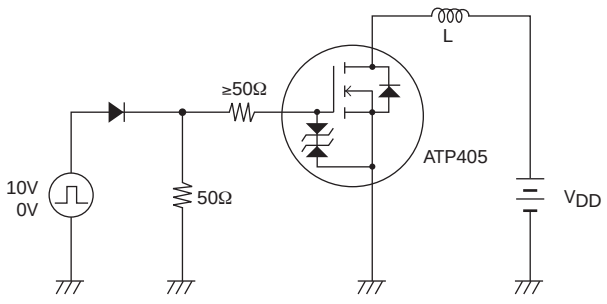
7057-001

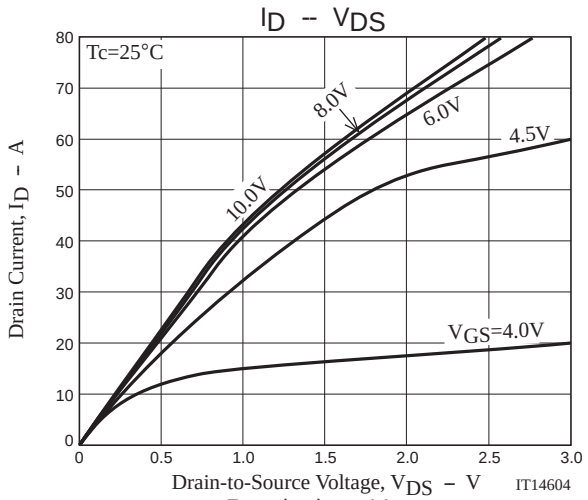


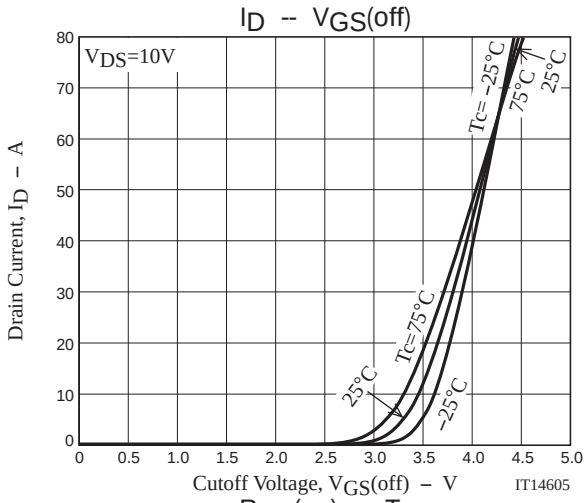
Switching Time Test Circuit

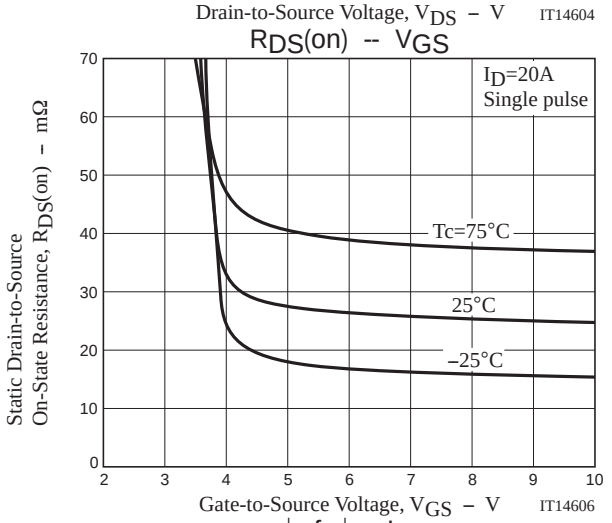


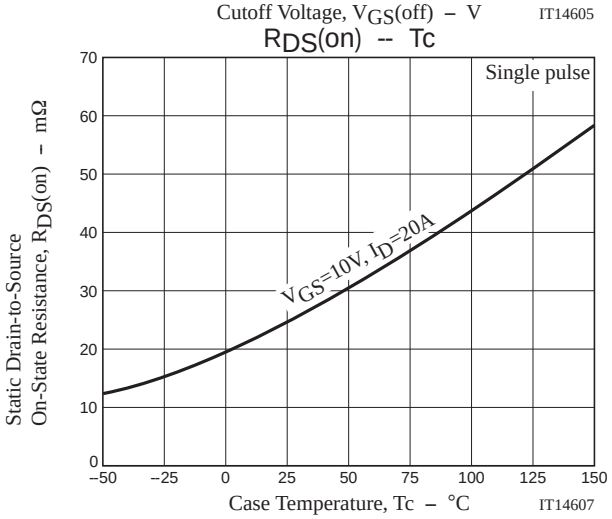
Avalanche Resistance Test Circuit

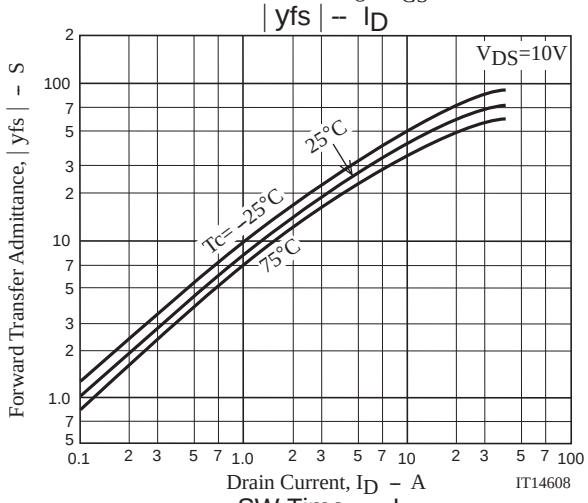


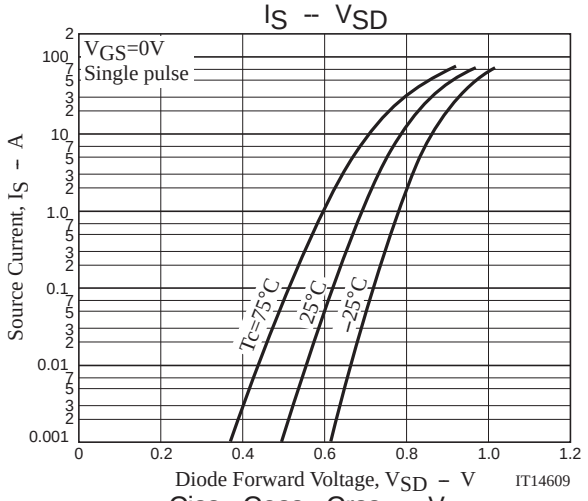

ID -- VDS
Tc=25°C
8.0V
6.0V
4.5V
10.0V
VGS=4.0V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT14604

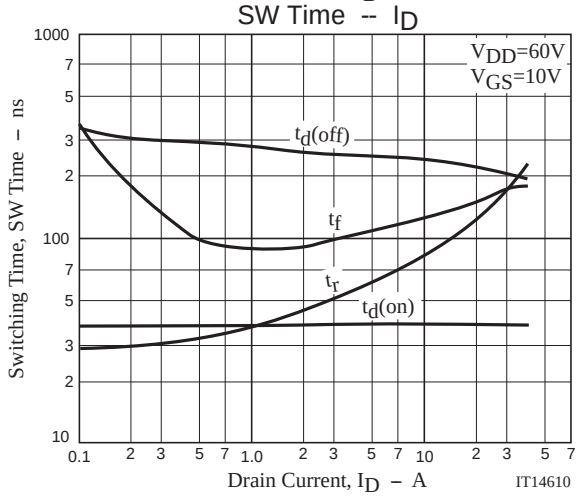

ID -- VGS(off)
VDS=10V
Tc= –25°C
75°C
25°C
Tc=75°C
25°C
–25°C
Drain Current, ID – A
Cutoff Voltage, VGS(off) – V
IT14605

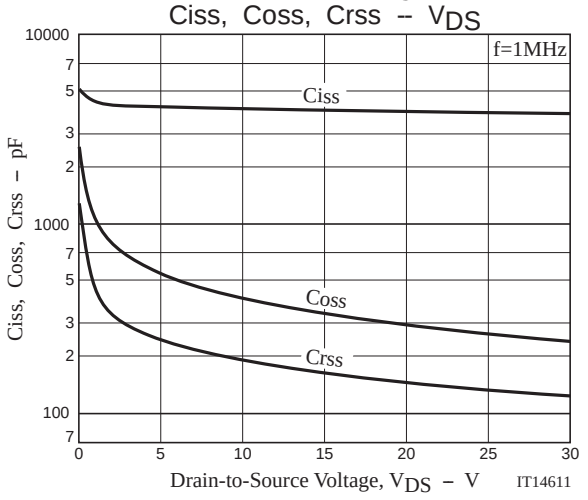

RDS(on) -- VGS
ID=20A
Single pulse
Tc=75°C
25°C
–25°C
Static Drain-to-Source
On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT14606

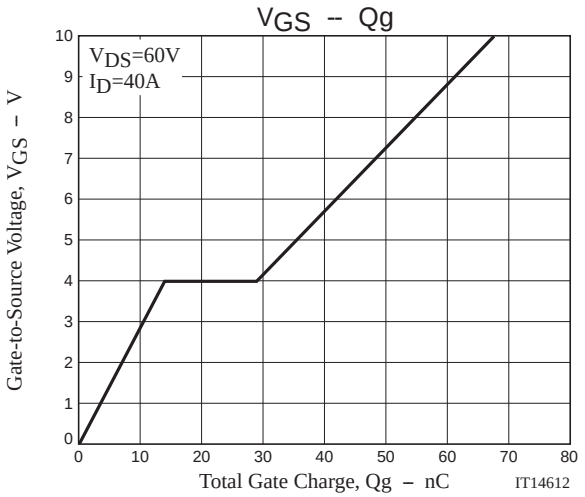

RDS(on) -- Tc
Single pulse
VGS=10V, ID=20A
Static Drain-to-Source
On-State Resistance, RDS(on) – mΩ
Case Temperature, Tc – °C
IT14607

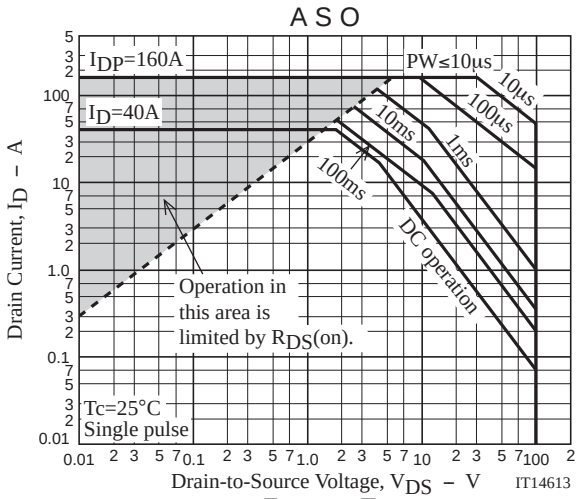

| yfs | -- ID
VDS=10V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT14608

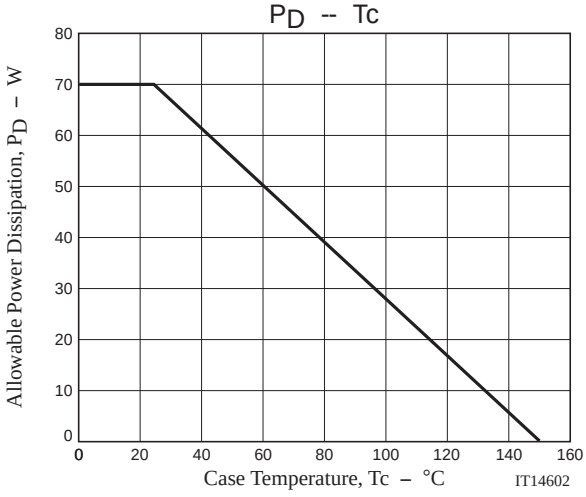

IS -- VSD
VGS=0V
Single pulse
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT14609

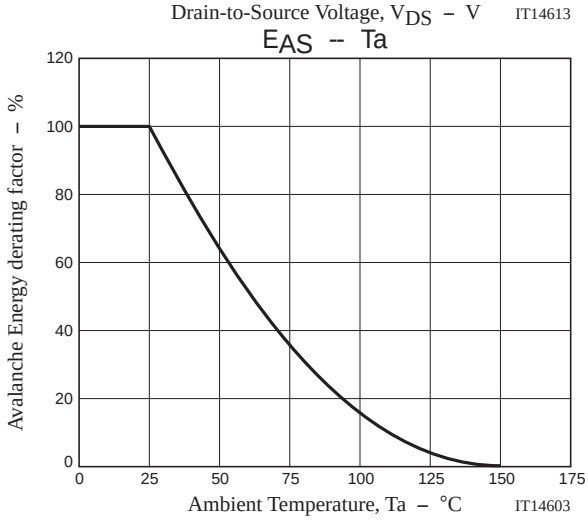

SW Time -- ID
VDD=60V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT14610


Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT14611









Note on usage : Since the ATP405 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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