



# ATP113 — P-Channel Silicon MOSFET

## General-Purpose Switching Device Applications

### Features

- ON-resistance  $R_{DS(on)1}=22.5m\Omega$ (typ.)
- Input Capacitance  $C_{iss}=2400pF$ (typ.)
- 4V drive
- Halogen free compliance

### Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	$V_{DSS}$		-60	V
Gate-to-Source Voltage	$V_{GSS}$		$\pm 20$	V
Drain Current (DC)	$I_D$		-35	A
Drain Current ( $PW \leq 10\mu s$ )	$I_{DP}$	$PW \leq 10\mu s$ , duty cycle $\leq 1\%$	-105	A
Allowable Power Dissipation	$P_D$	$T_c=25^\circ C$	50	W
Channel Temperature	$T_{ch}$		150	$^\circ C$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ C$
Avalanche Energy (Single Pulse) *1	$E_{AS}$		95	mJ
Avalanche Current *2	$I_{AV}$		-18	A

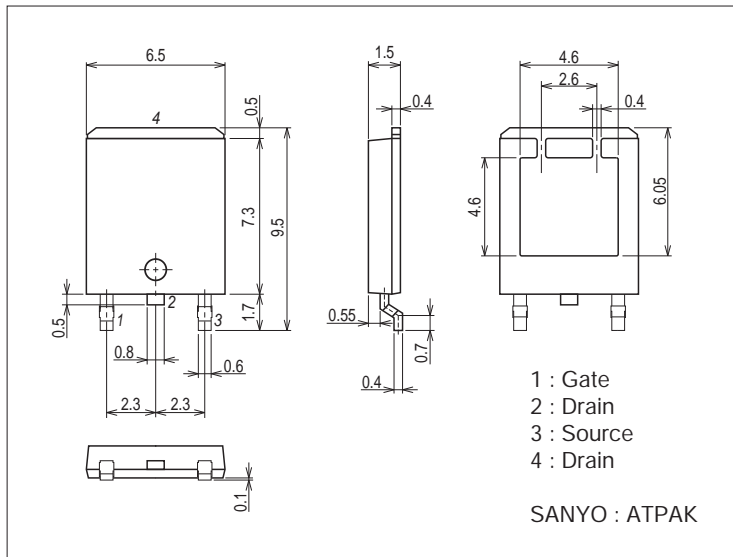
Note : \*1  $V_{DD}=-10V$ ,  $L=500\mu H$ ,  $I_{AV}=-18A$

\*2  $L \leq 500\mu H$ , Single pulse

### Package Dimensions

unit : mm (typ)

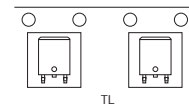
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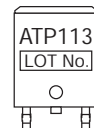
### Product & Package Information

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

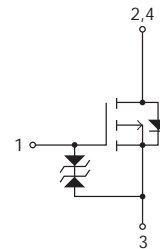
### Packing Type: TL



### Marking



### Electrical Connection

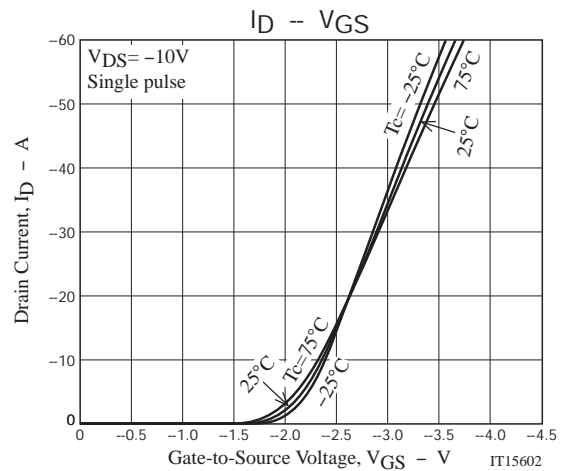
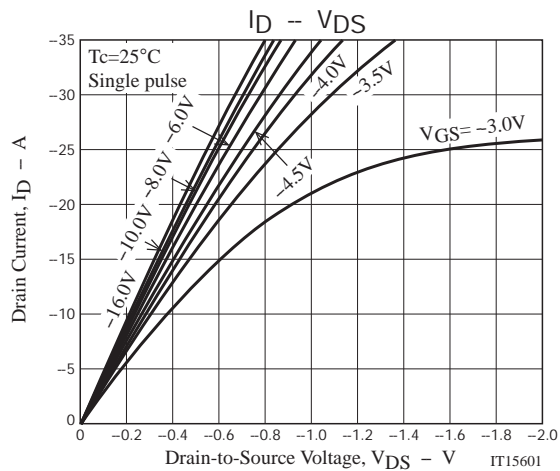
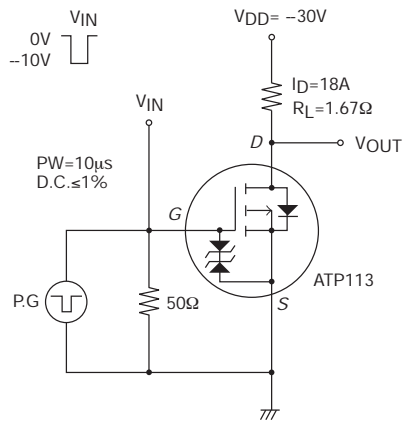


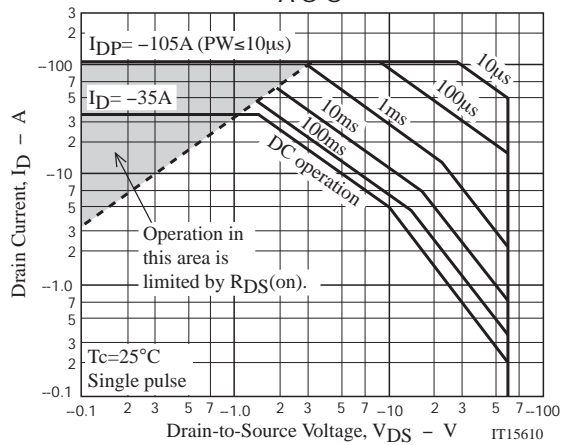
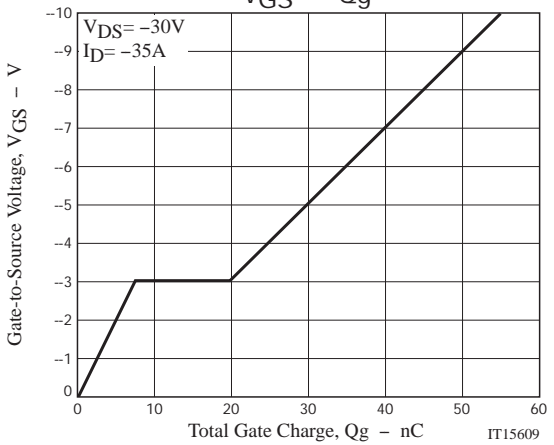
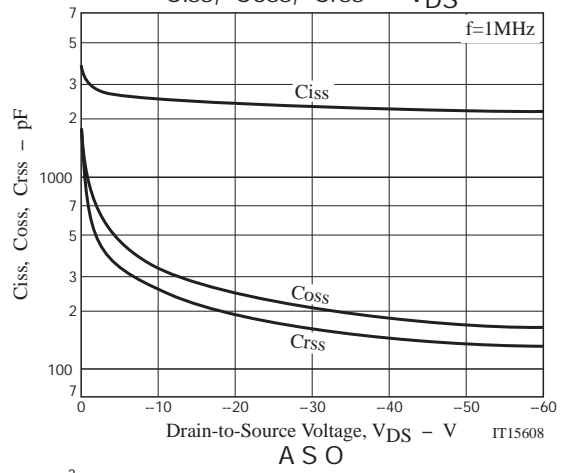
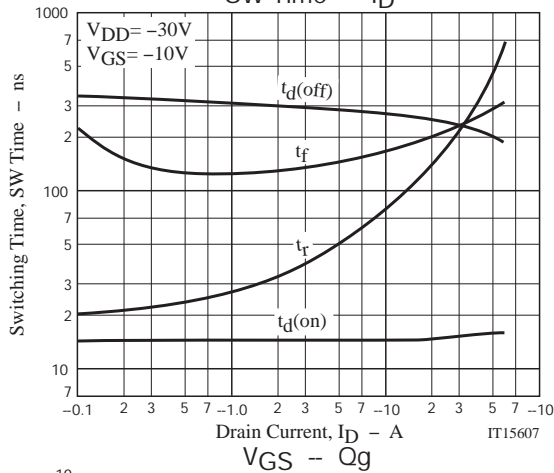
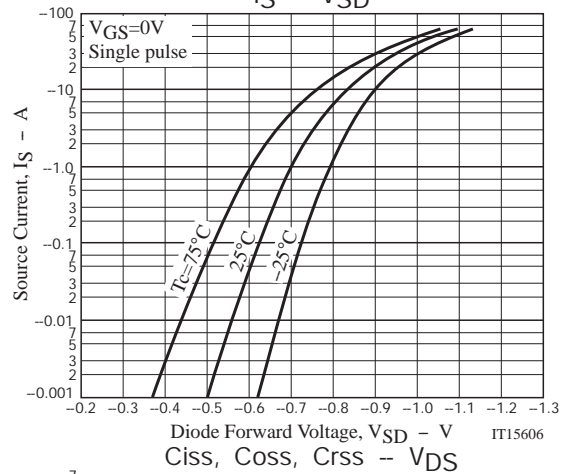
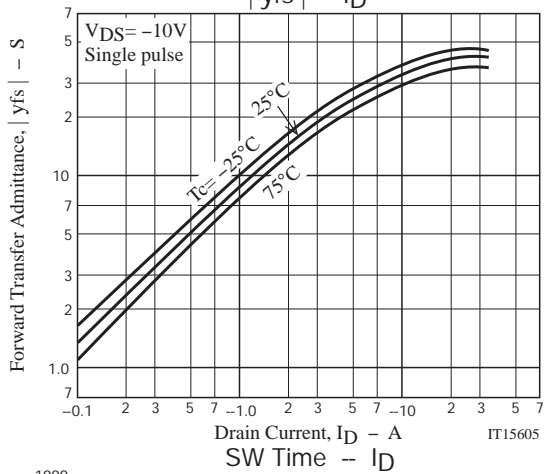
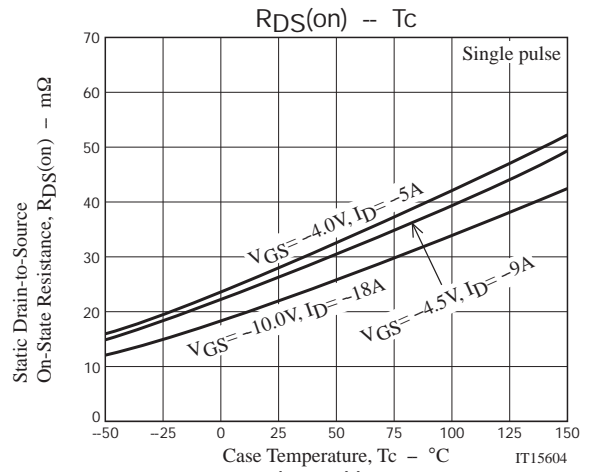
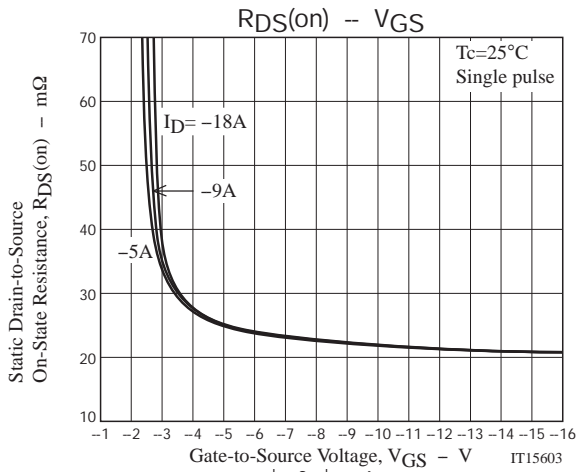
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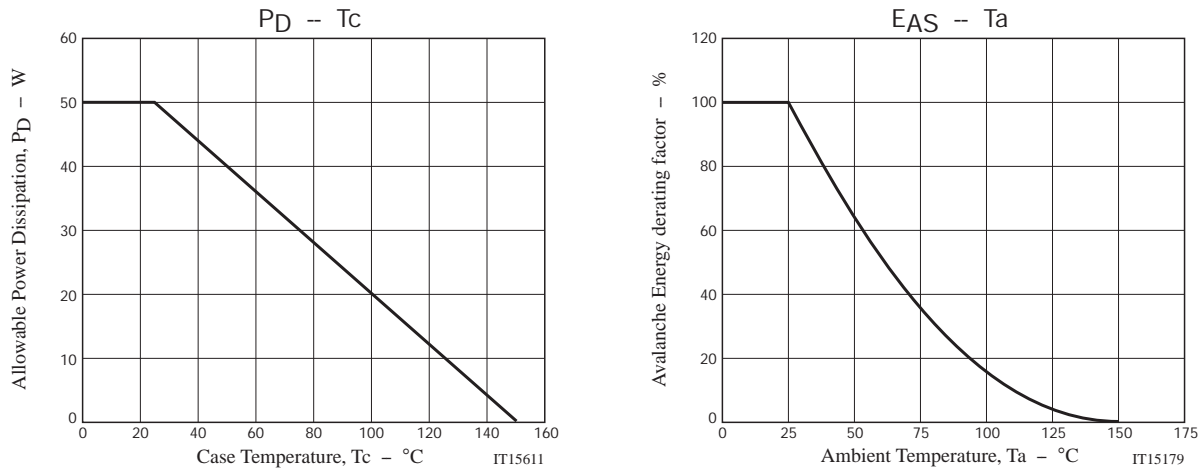
## Electrical Characteristics at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=-1\text{mA}, V_{GS}=0\text{V}$	-60			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-60\text{V}, V_{GS}=0\text{V}$			-1	$\mu\text{A}$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 16\text{V}, V_{DS}=0\text{V}$			$\pm 10$	$\mu\text{A}$
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=-10\text{V}, I_D=-1\text{mA}$	-1.2		-2.6	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=-10\text{V}, I_D=-18\text{A}$		37		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=-18\text{A}, V_{GS}=-10\text{V}$		22.5	29.5	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=-9\text{A}, V_{GS}=-4.5\text{V}$		27	38	$\text{m}\Omega$
	$R_{DS(on)3}$	$I_D=-5\text{A}, V_{GS}=-4\text{V}$		29	44	$\text{m}\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=-20\text{V}, f=1\text{MHz}$		2400		pF
Output Capacitance	$C_{oss}$	$V_{DS}=-20\text{V}, f=1\text{MHz}$		250		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS}=-20\text{V}, f=1\text{MHz}$		195		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		15		ns
Rise Time	$t_r$	See specified Test Circuit.		125		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit.		250		ns
Fall Time	$t_f$	See specified Test Circuit.		200		ns
Total Gate Charge	$Q_g$	$V_{DS}=-30\text{V}, V_{GS}=-10\text{V}, I_D=-35\text{A}$		55		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=-30\text{V}, V_{GS}=-10\text{V}, I_D=-35\text{A}$		7.5		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$	$V_{DS}=-30\text{V}, V_{GS}=-10\text{V}, I_D=-35\text{A}$		12		nC
Diode Forward Voltage	$V_{SD}$	$I_S=-35\text{A}, V_{GS}=0\text{V}$		-0.98	-1.5	V

## Switching Time Test Circuit







Note on usage : Since the ATP113 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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