



ON Semiconductor®

# ON Semiconductor DATA SHEET

## CPH6413

N-Channel Silicon MOSFET

### Ultrahigh-Speed Switching Applications

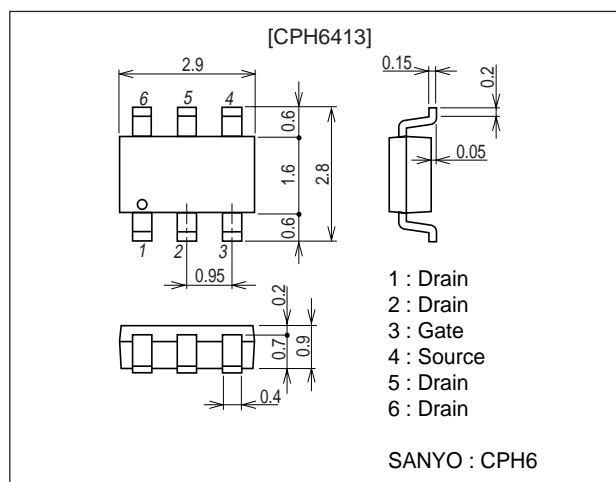
#### Features

- Low ON-resistance.
- Ultrahigh-speed switching.
- 2.5V drive.

#### Package Dimensions

unit : mm

2151A



#### Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V <sub>DSS</sub>		20	V
Gate-to-Source Voltage	V <sub>GSS</sub>		±10	V
Drain Current (DC)	I <sub>D</sub>		5	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	20	A
Allowable Power Dissipation	P <sub>D</sub>	Mounted on a ceramic board (1200mm²×0.8mm)	1.6	W
Channel Temperature	T <sub>ch</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

Electrical Characteristics at Ta=25°C

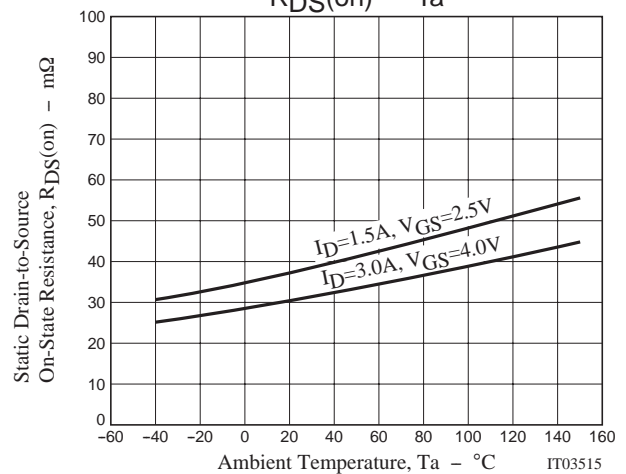
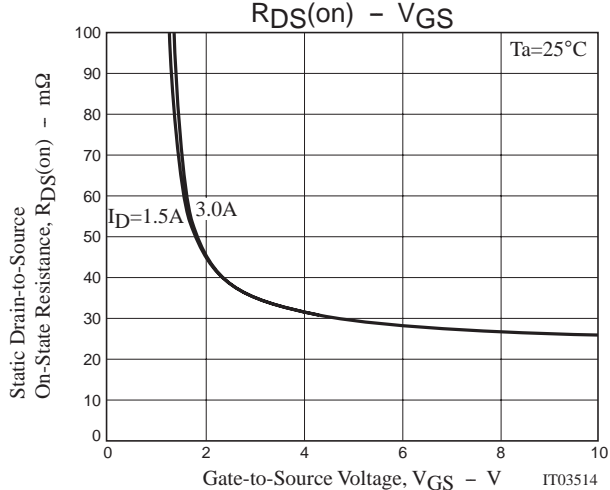
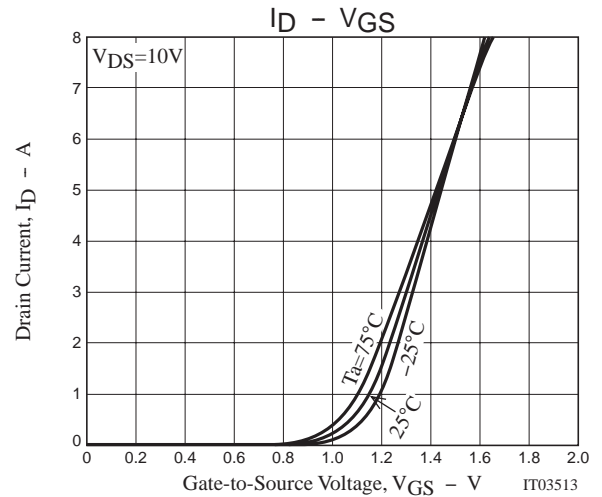
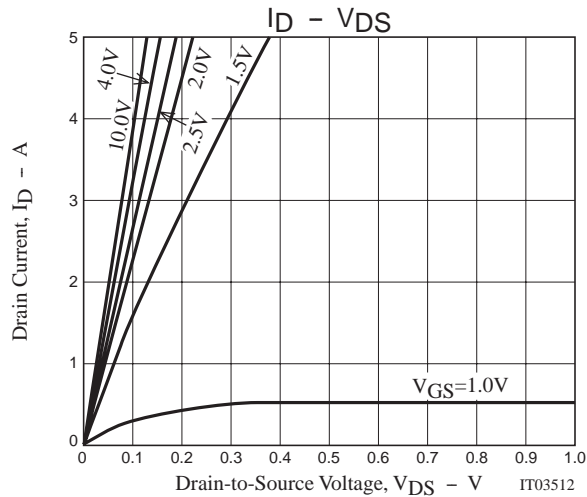
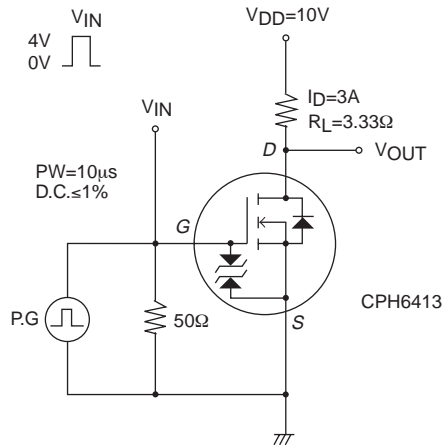
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> =1mA, V <sub>GS</sub> =0	20			V
Zero-Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0			1	μA
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±8V, V <sub>DS</sub> =0			±10	μA
Cutoff Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA	0.4		1.3	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =3A	6.3	9		S
Static Drain-to-Source On-State Resistance	R <sub>DS(on)1</sub>	I <sub>D</sub> =3A, V <sub>GS</sub> =4V		31	41	mΩ
	R <sub>DS(on)2</sub>	I <sub>D</sub> =1.5A, V <sub>GS</sub> =2.5V		38	54	mΩ

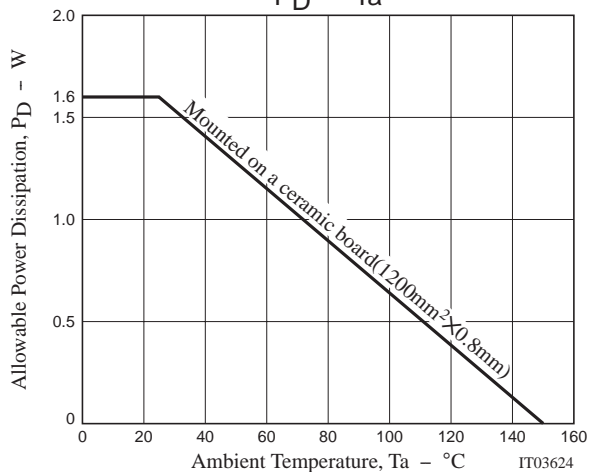
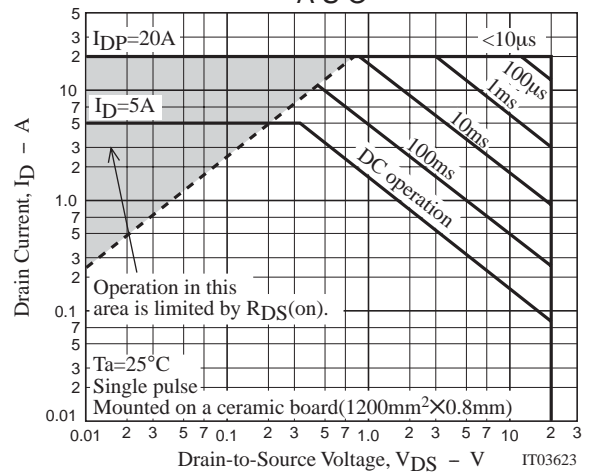
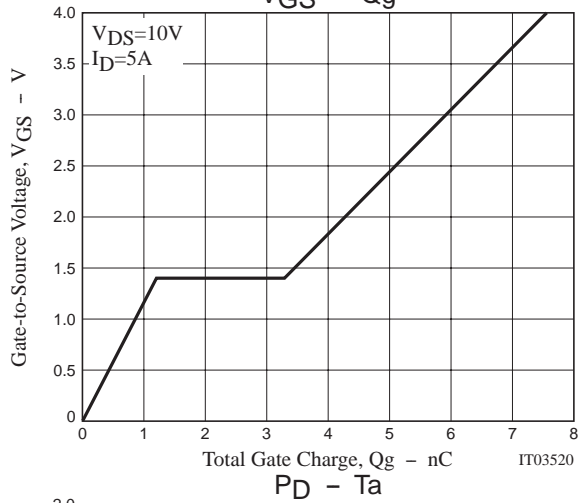
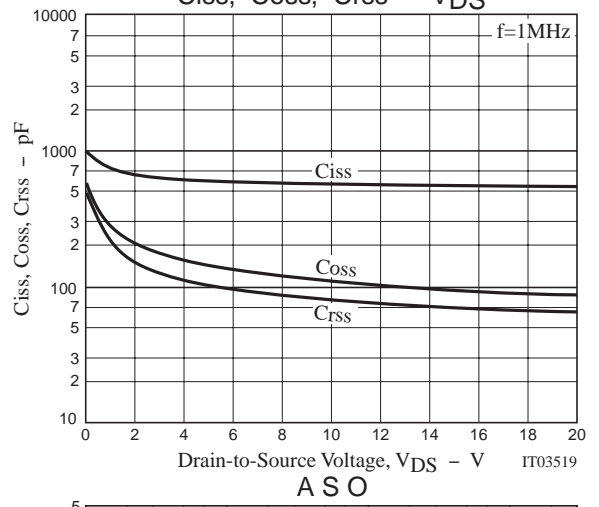
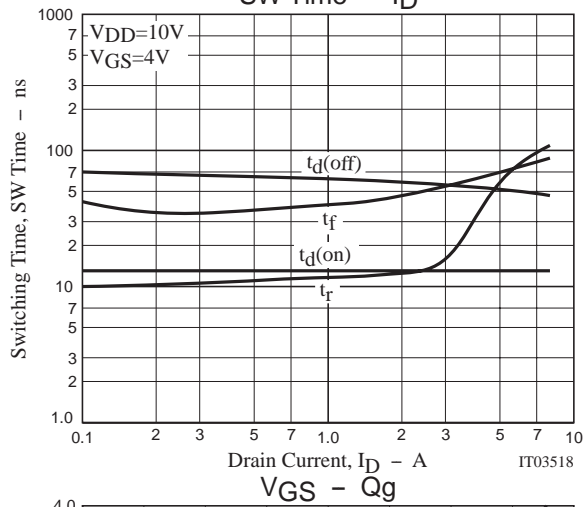
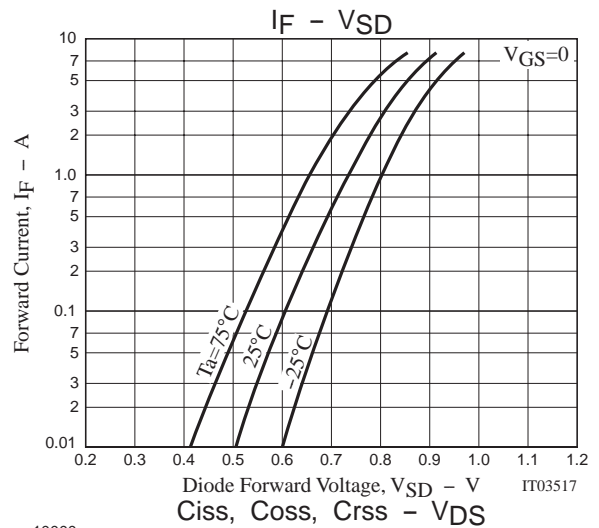
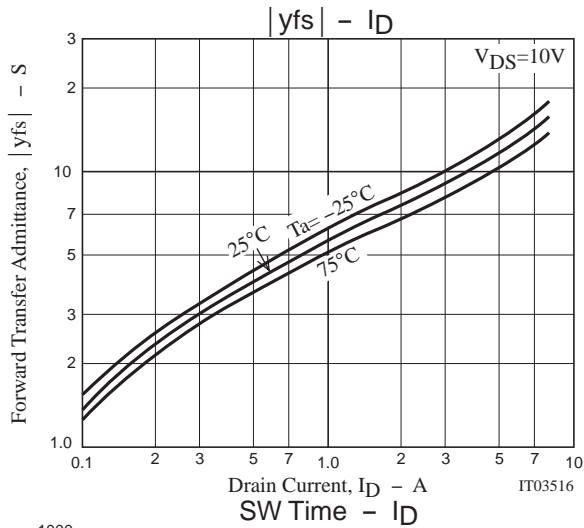
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	$V_{DS}=10V$ , $f=1MHz$		570		pF
Output Capacitance	Coss	$V_{DS}=10V$ , $f=1MHz$		110		pF
Reverse Transfer Capacitance	Crss	$V_{DS}=10V$ , $f=1MHz$		80		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		13		ns
Rise Time	$t_r$	See specified Test Circuit.		16		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit.		55		ns
Fall Time	$t_f$	See specified Test Circuit.		54		ns
Total Gate Charge	Qg	$V_{DS}=10V$ , $V_{GS}=4V$ , $I_D=5A$		7.6		nC
Gate-to-Source Charge	Qgs	$V_{DS}=10V$ , $V_{GS}=4V$ , $I_D=5A$		1.2		nC
Gate-to-Drain "Miller" Charge	Qgd	$V_{DS}=10V$ , $V_{GS}=4V$ , $I_D=5A$		2.1		nC
Diode Forward Voltage	$V_{SD}$	$I_S=5A$ , $V_{GS}=0$		0.86	1.2	V

**Switching Time Test Circuit**



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