



ECH8668 — General-Purpose Switching Device Applications

N-Channel and P-Channel Silicon MOSFETs

Features

- The ECH8660 incorporates an N-channel MOSFET and a P-channel MOSFET that feature low ON-resistance and high-speed switching , thereby enabling high-density mounting.
- 1.8V drive.
- Halogen free compliance.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	N-channel	P-channel	Unit
Drain-to-Source Voltage	V _{DSS}		20	-20	V
Gate-to-Source Voltage	V _{GSS}		±10	±10	V
Drain Current (DC)	I _D		7.5	-5	A
Drain Current (Pulse)	I _{DP}	PW≤10μs, duty cycle≤1%	40	-40	A
Allowable Power Dissipation	P _D	When mounted on ceramic substrate (900mm ² ×0.8mm) 1unit	1.3		W
Total Dissipation	P _T	When mounted on ceramic substrate (900mm ² ×0.8mm)	1.5		W
Channel Temperature	T _{ch}		150		°C
Storage Temperature	T _{stg}		-55 to +150		°C

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[N-channel]						
Drain-to-Source Breakdown Voltage	V(BR) _{DSS}	I _D =1mA, V _{GS} =0V	20			V
Zero-Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V			1	μA
Gate-to-Source Leakage Current	I _{GSS}	V _{GS} =±8V, V _{DS} =0V			±10	μA
Cutoff Voltage	V _{GS(off)}	V _{DS} =10V, I _D =1mA	0.5		1.3	V

Marking : TP

Continued on next page.

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ECH8668

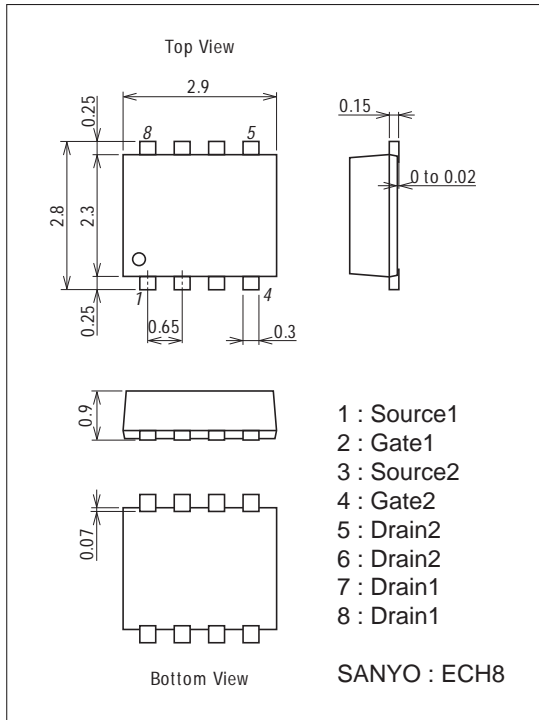
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Forward Transfer Admittance	yfs	V _{DS} =10V, I _D =4A	4.2	7		S
Static Drain-to-Source On-State Resistance	R _{DS(on)1}	I _D =4A, V _{GS} =4.5V		13	17	mΩ
	R _{DS(on)2}	I _D =2A, V _{GS} =2.5V		18	26	mΩ
	R _{DS(on)3}	I _D =0.5A, V _{GS} =1.8V		30	48	mΩ
Input Capacitance	C _{iss}	V _{DS} =10V, f=1MHz		1060		pF
Output Capacitance	C _{oss}	V _{DS} =10V, f=1MHz		180		pF
Reverse Transfer Capacitance	C _{rss}	V _{DS} =10V, f=1MHz		135		pF
Turn-ON Delay Time	t _{d(on)}	See specified Test Circuit.		17.5		ns
Rise Time	t _r	See specified Test Circuit.		120		ns
Turn-OFF Delay Time	t _{d(off)}	See specified Test Circuit.		68		ns
Fall Time	t _f	See specified Test Circuit.		80		ns
Total Gate Charge	Q _g	V _{DS} =10V, V _{GS} =4.5V, I _D =7.5A		10.8		nC
Gate-to-Source Charge	Q _{gs}	V _{DS} =10V, V _{GS} =4.5V, I _D =7.5A		2.1		nC
Gate-to-Drain "Miller" Charge	Q _{gd}	V _{DS} =10V, V _{GS} =4.5V, I _D =7.5A		2.9		nC
Diode Forward Voltage	V _{SD}	I _S =7.5A, V _{GS} =0V		0.74	1.2	V
[P-channel]						
Drain-to-Source Breakdown Voltage	V(BR) _{DSS}	I _D =-1mA, V _{GS} =0V	-20			V
Zero-Gate Voltage Drain Current	I _{DSS}	V _{DS} =-20V, V _{GS} =0V			-1	μA
Gate-to-Source Leakage Current	I _{GSS}	V _{GS} =±8V, V _{DS} =0V			±10	μA
Cutoff Voltage	V _{GS(off)}	V _{DS} =-10V, I _D =-1mA	-0.4		-1.3	V
Forward Transfer Admittance	yfs	V _{DS} =-10V, I _D =-3A	4.9	8.3		S
Static Drain-to-Source On-State Resistance	R _{DS(on)1}	I _D =-3A, V _{GS} =-4.5V		29	38	mΩ
	R _{DS(on)2}	I _D =-1.5A, V _{GS} =-2.5V		41	58	mΩ
	R _{DS(on)3}	I _D =-0.5A, V _{GS} =-1.8V		64	98	mΩ
Input Capacitance	C _{iss}	V _{DS} =-10V, f=1MHz		960		pF
Output Capacitance	C _{oss}	V _{DS} =-10V, f=1MHz		180		pF
Reverse Transfer Capacitance	C _{rss}	V _{DS} =-10V, f=1MHz		140		pF
Turn-ON Delay Time	t _{d(on)}	See specified Test Circuit.		14		ns
Rise Time	t _r	See specified Test Circuit.		55		ns
Turn-OFF Delay Time	t _{d(off)}	See specified Test Circuit.		92		ns
Fall Time	t _f	See specified Test Circuit.		68		ns
Total Gate Charge	Q _g	V _{DS} =-10V, V _{GS} =-4.5V, I _D =-5A		11		nC
Gate-to-Source Charge	Q _{gs}	V _{DS} =-10V, V _{GS} =-4.5V, I _D =-5A		2.0		nC
Gate-to-Drain "Miller" Charge	Q _{gd}	V _{DS} =-10V, V _{GS} =-4.5V, I _D =-5A		2.8		nC
Diode Forward Voltage	V _{SD}	I _S =-5A, V _{GS} =0V		-0.82	-1.2	V

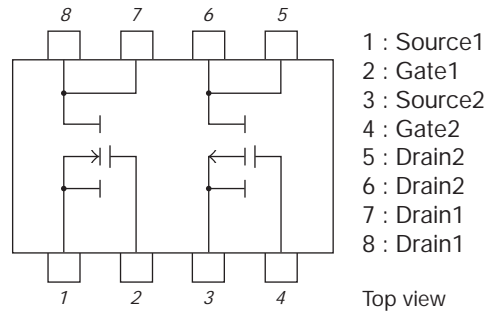
Package Dimensions

unit : mm (typ)

7011A-001

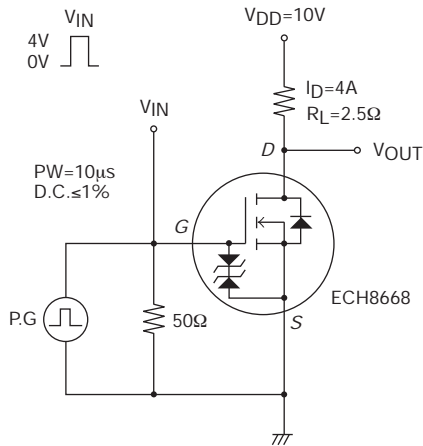


Electrical Connection

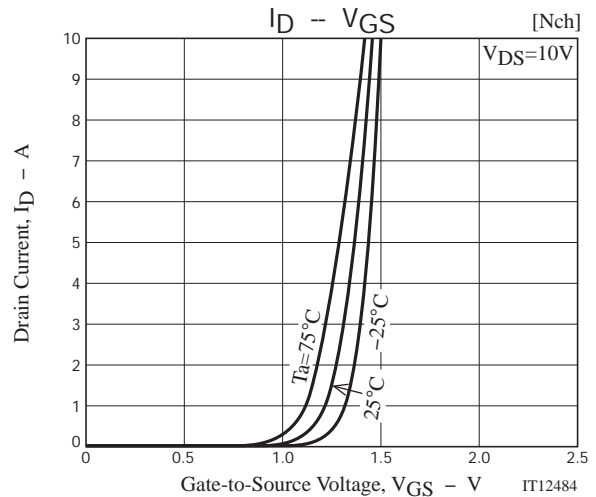
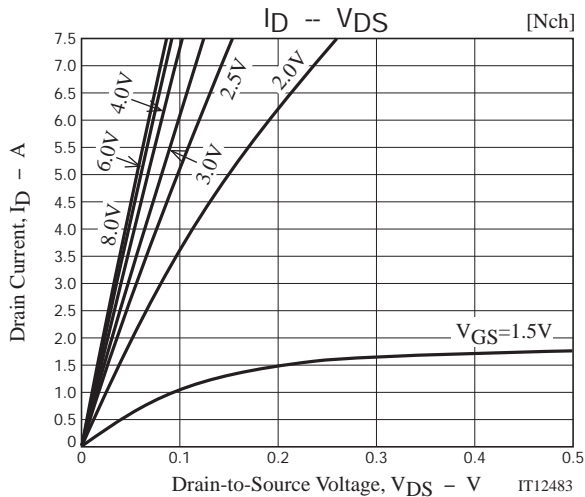
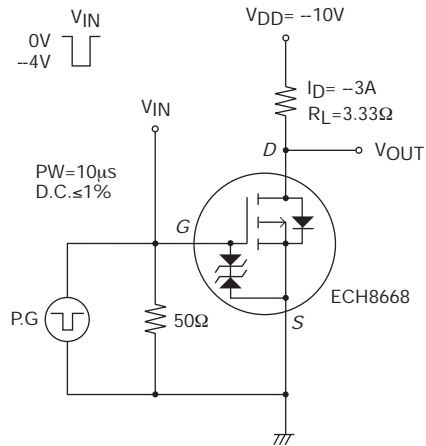


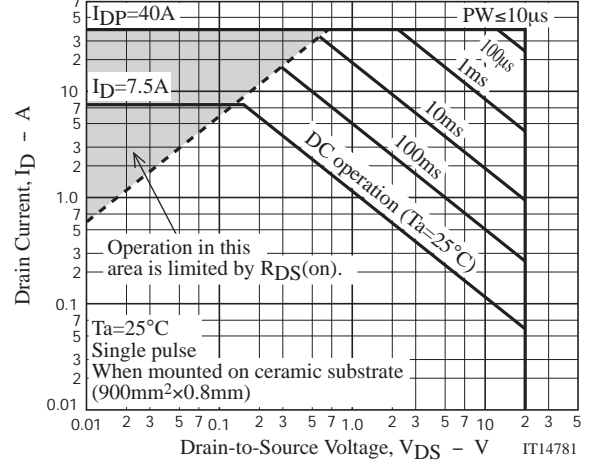
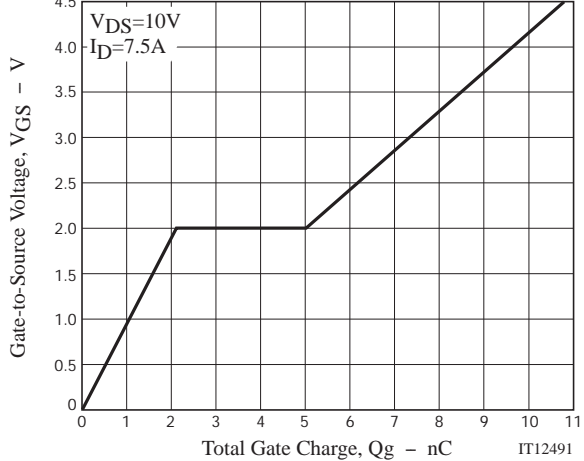
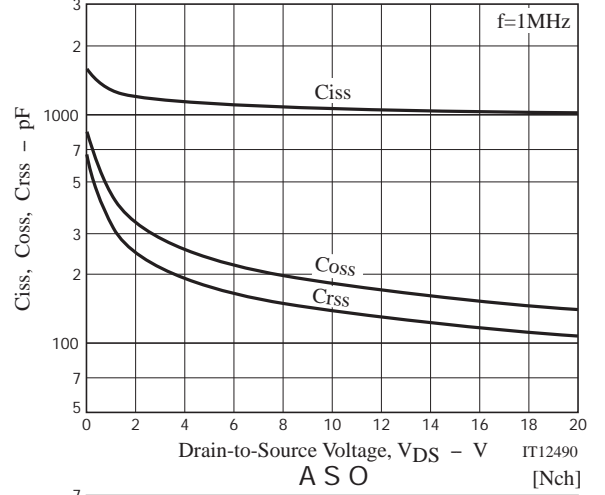
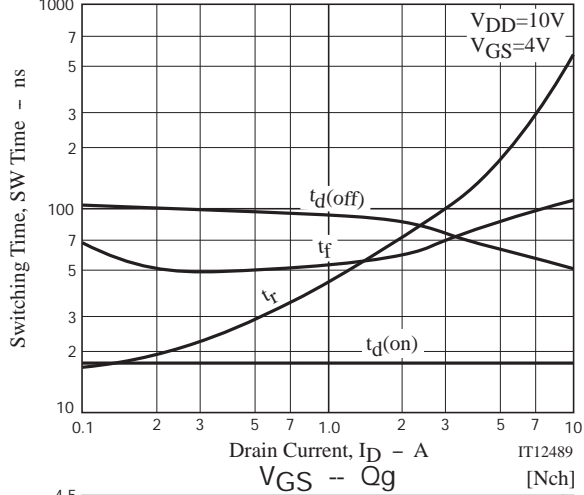
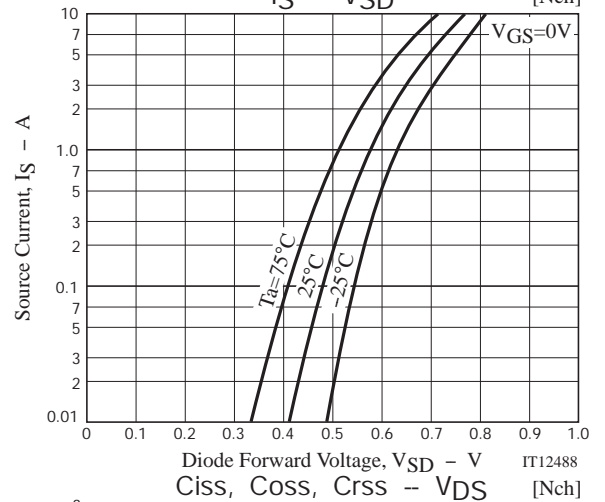
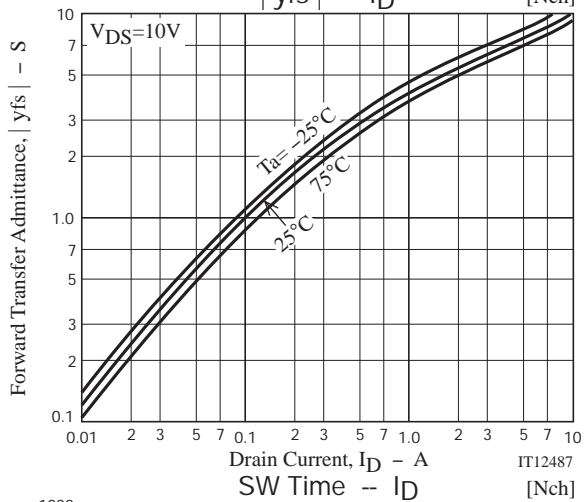
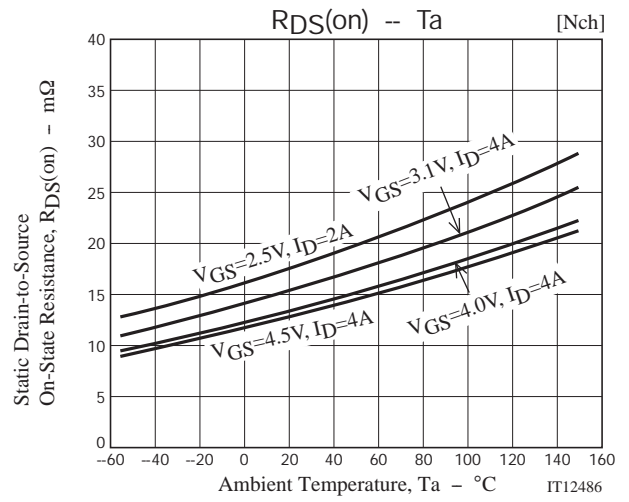
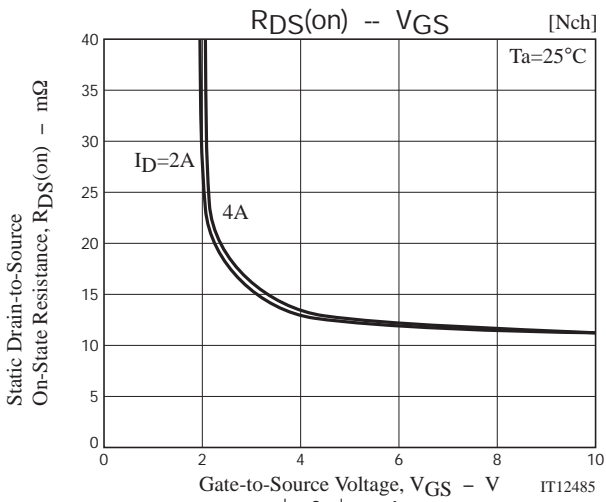
Switching Time Test Circuit

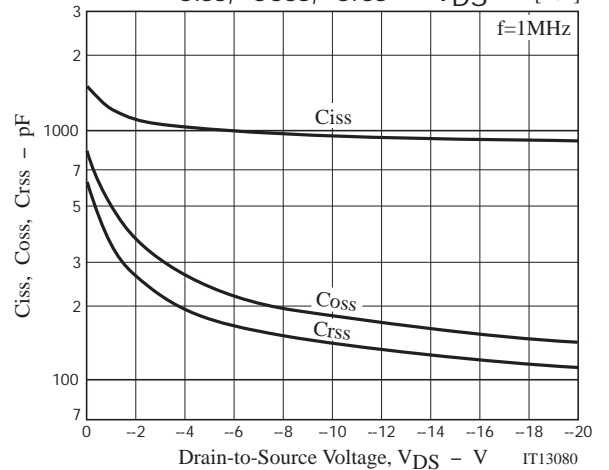
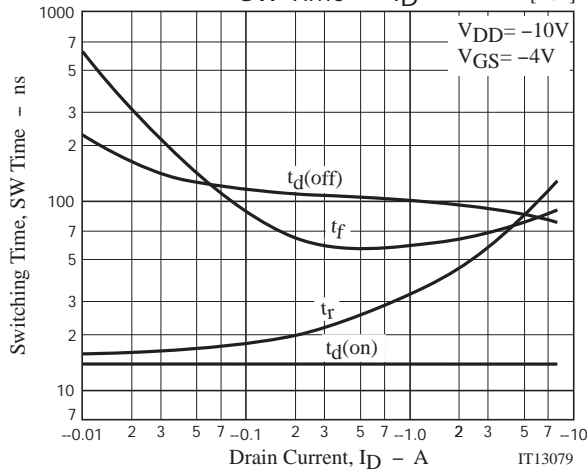
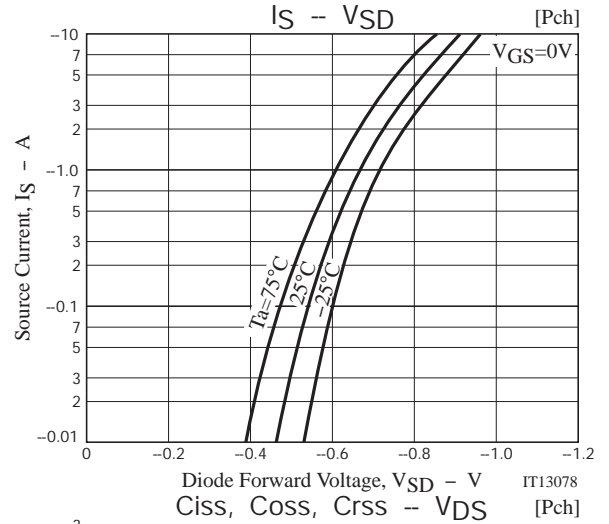
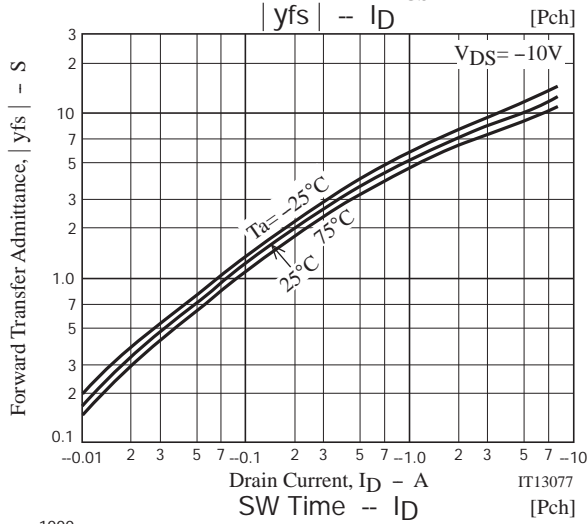
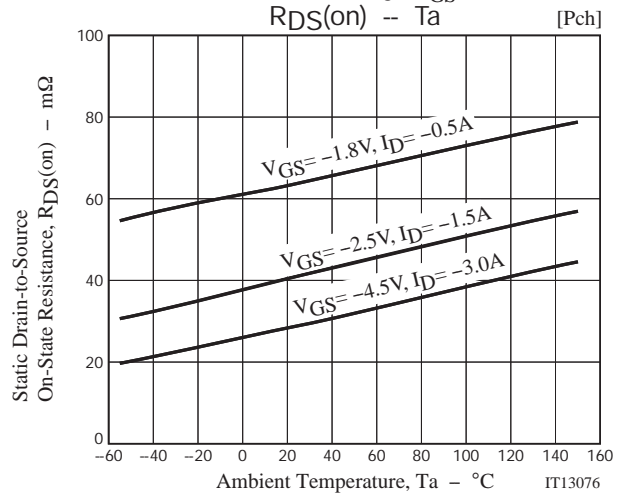
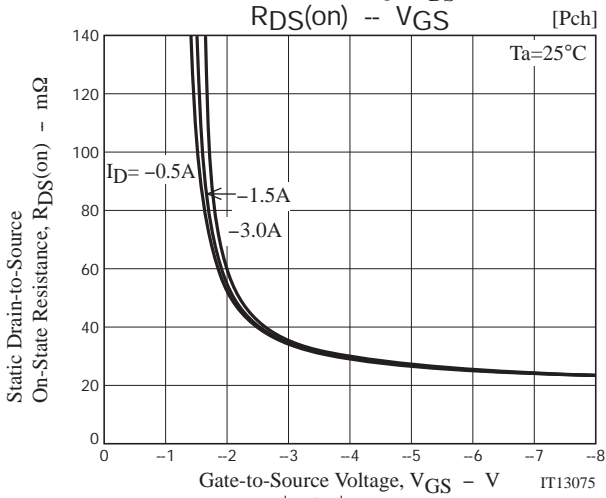
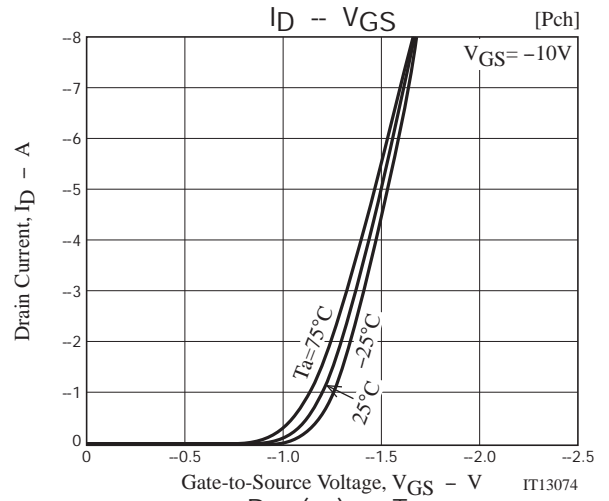
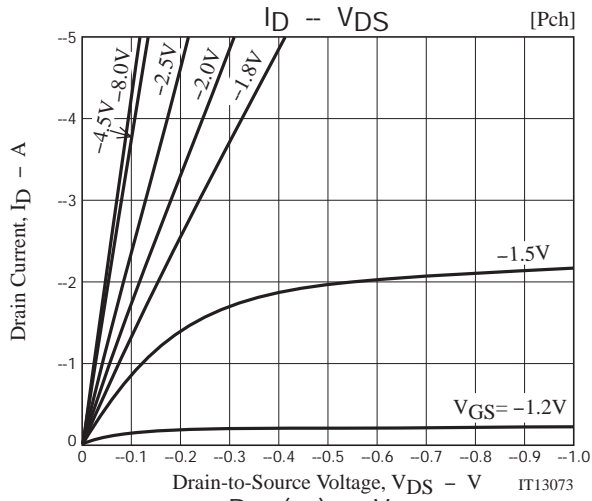
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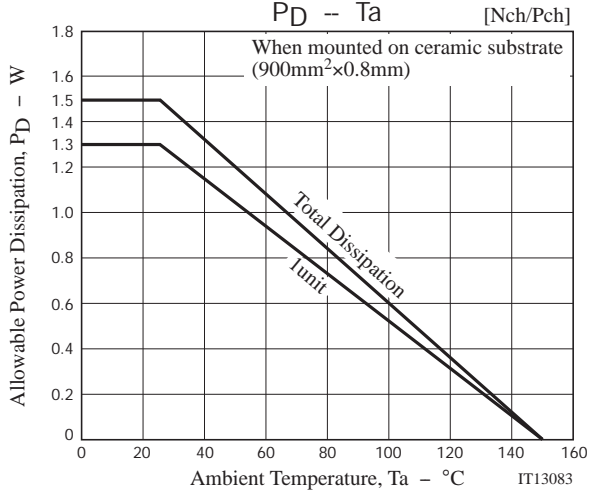
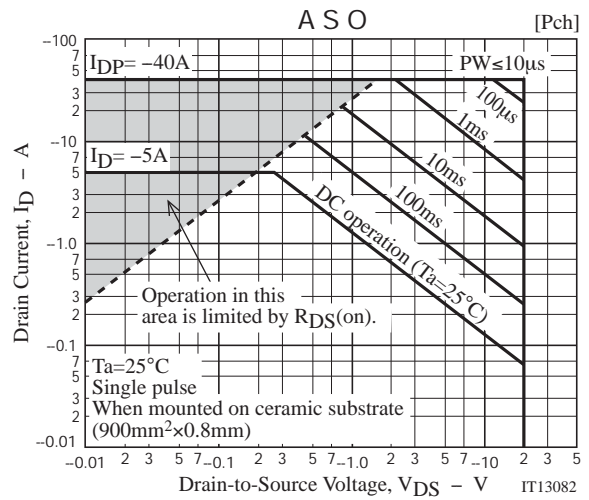
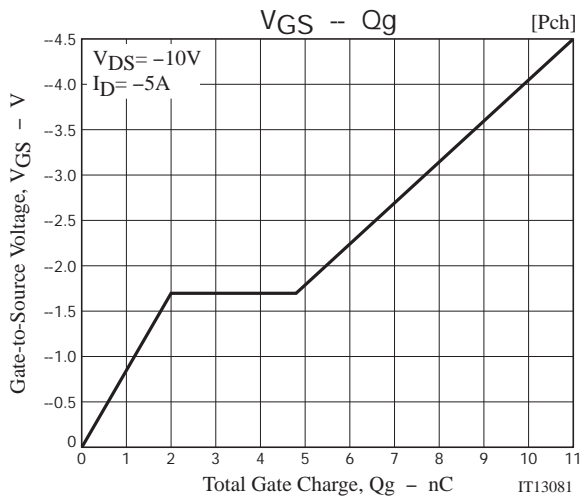


[P-channel]









Note on usage : Since the ECH8668 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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