



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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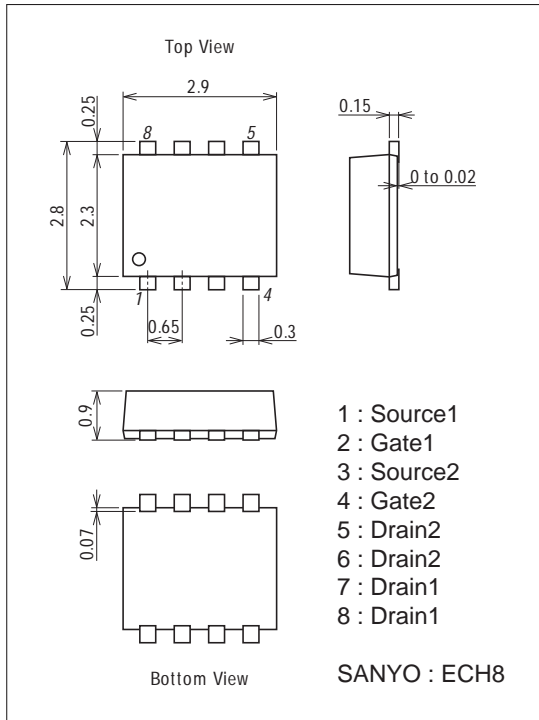
ECH8668

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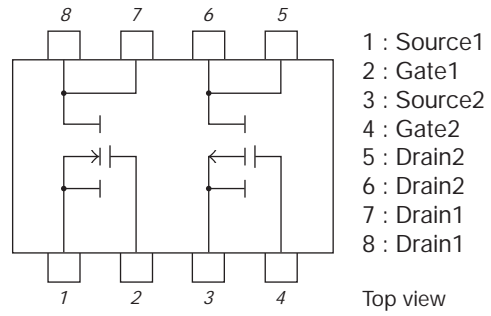
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10V, I_D=4A$	4.2	7		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=4A, V_{GS}=4.5V$		13	17	$m\Omega$
	$R_{DS(on)2}$	$I_D=2A, V_{GS}=2.5V$		18	26	$m\Omega$
	$R_{DS(on)3}$	$I_D=0.5A, V_{GS}=1.8V$		30	48	$m\Omega$
Input Capacitance	C_{iss}	$V_{DS}=10V, f=1MHz$		1060		μF
Output Capacitance	C_{oss}	$V_{DS}=10V, f=1MHz$		180		μF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=10V, f=1MHz$		135		μF
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}	$V_{GS}=\pm 8V, V_{DS}=0V$			± 10	μA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=-10V, I_D=-1mA$	-0.4		-1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=-10V, I_D=-3A$	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	$m\Omega$
	$R_{DS(on)2}$	$I_D=-1.5A, V_{GS}=-2.5V$		41	58	$m\Omega$
	$R_{DS(on)3}$	$I_D=-0.5A, V_{GS}=-1.8V$		64	98	$m\Omega$
Input Capacitance	C_{iss}	$V_{DS}=-10V, f=1MHz$		960		μF
Output Capacitance	C_{oss}	$V_{DS}=-10V, f=1MHz$		180		μF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=-10V, f=1MHz$		140		μF
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

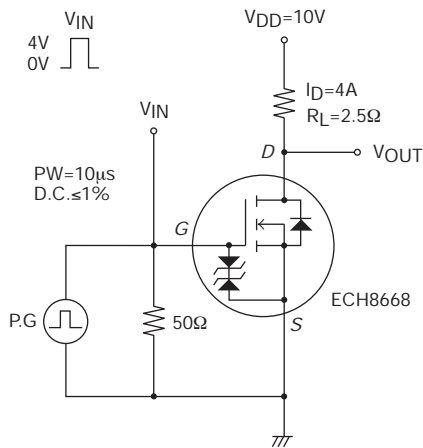


Electrical Connection

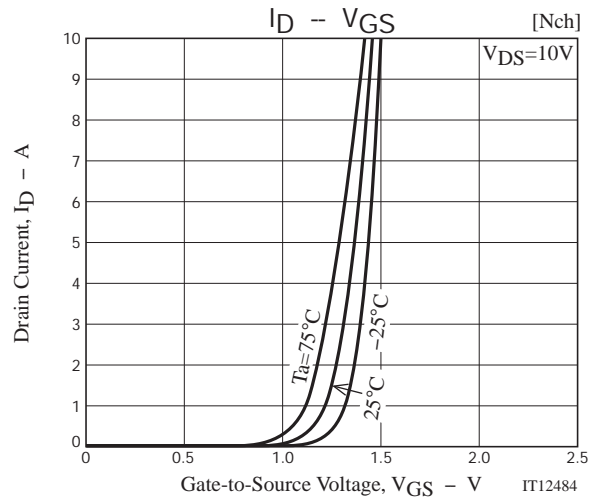
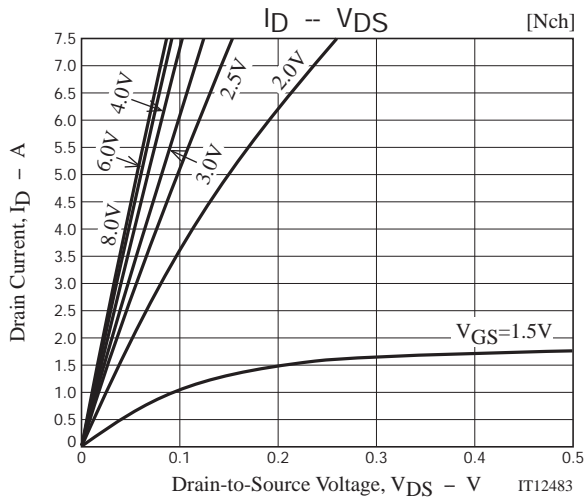
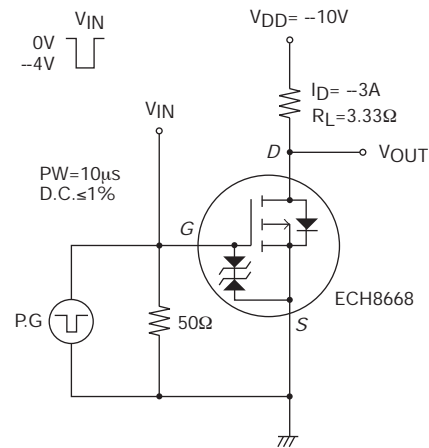


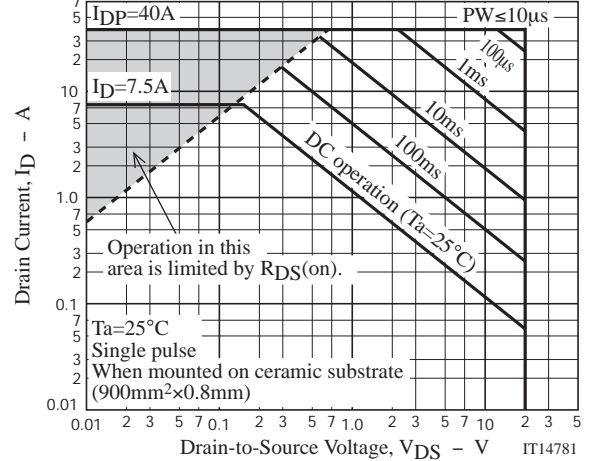
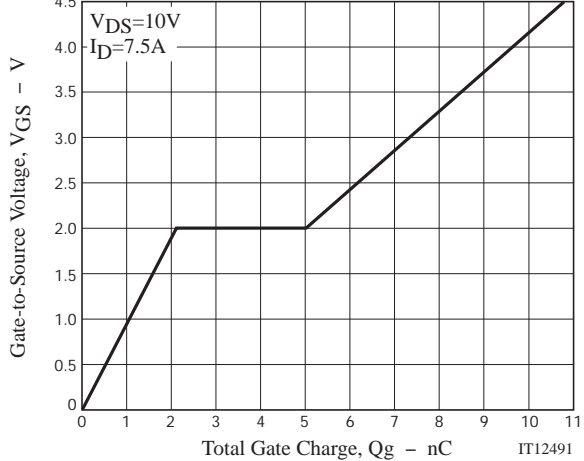
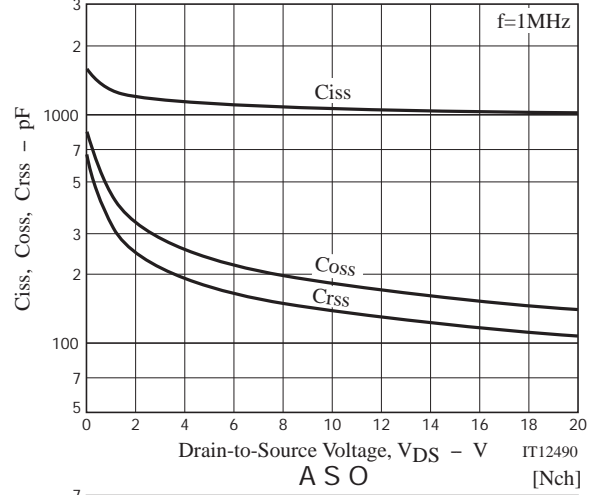
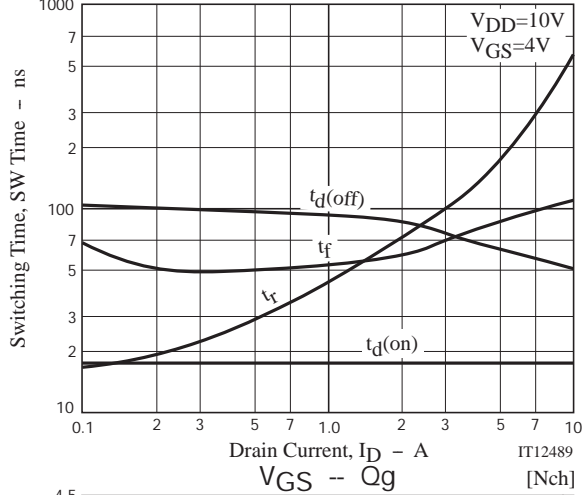
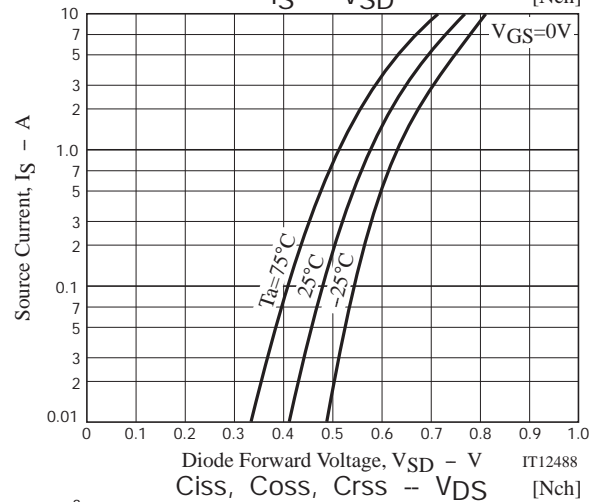
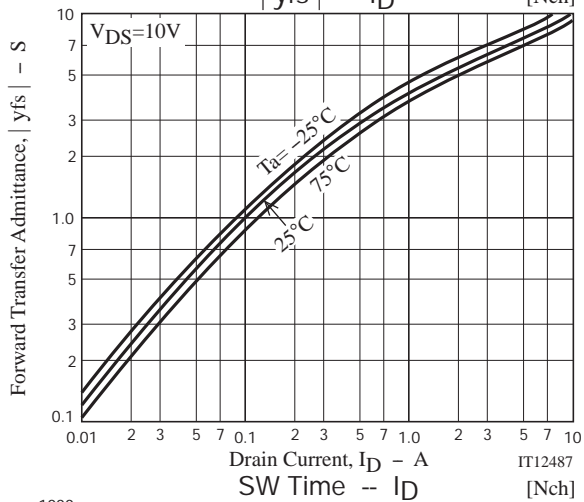
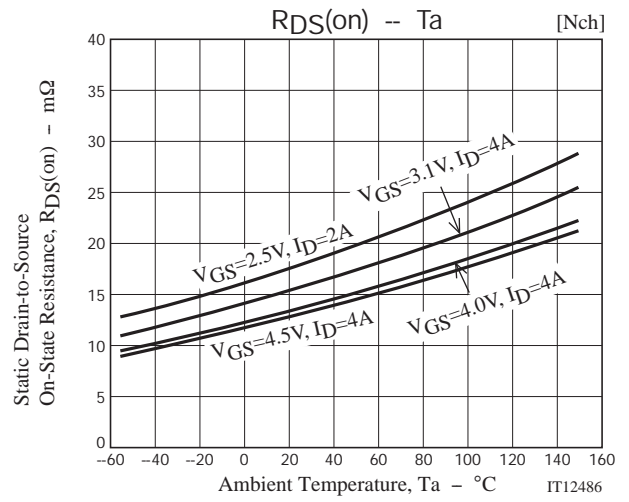
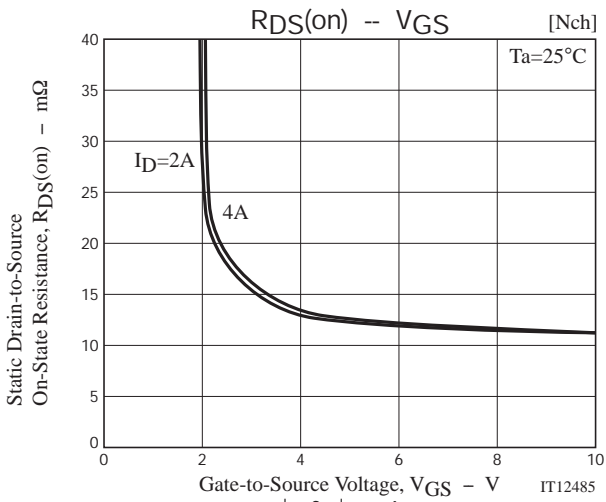
Switching Time Test Circuit

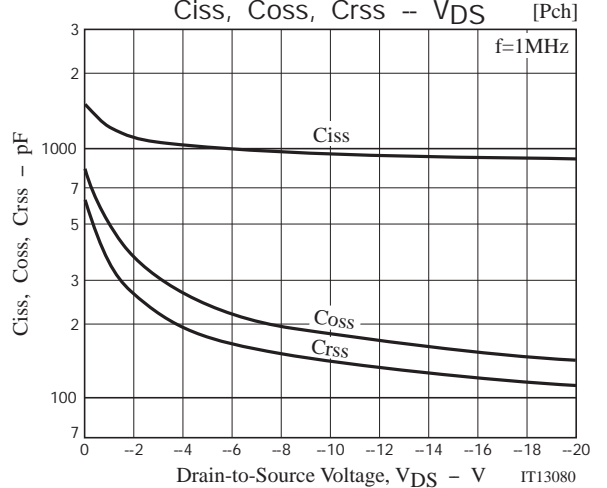
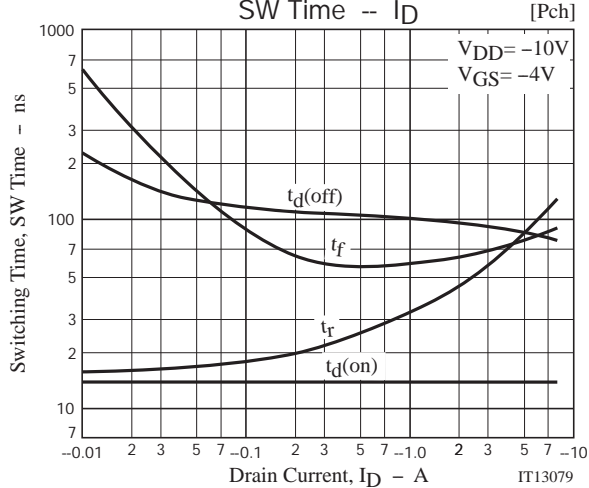
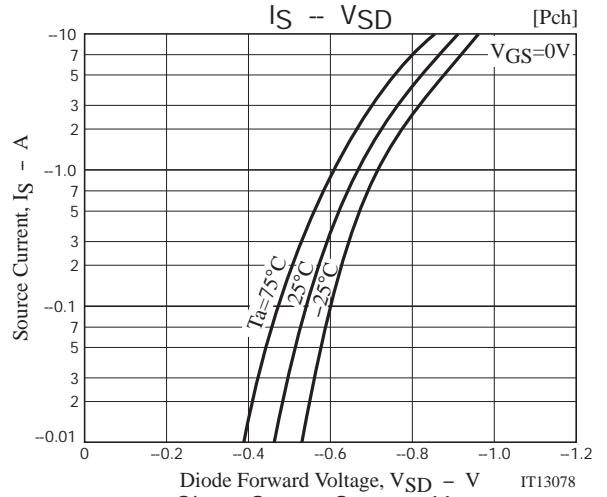
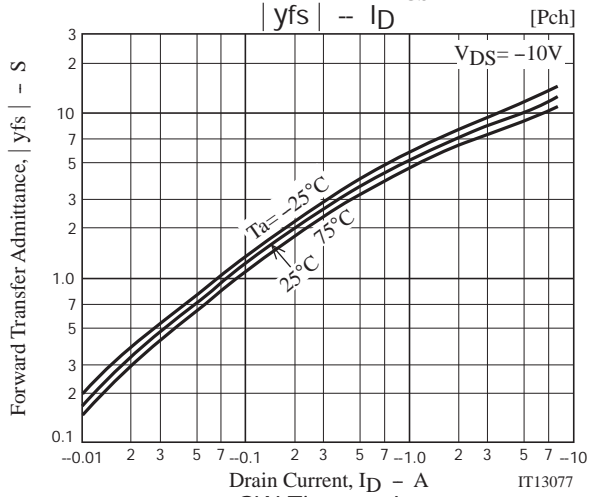
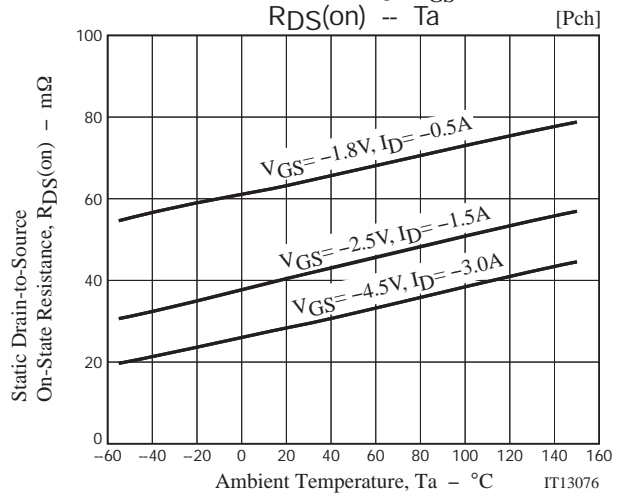
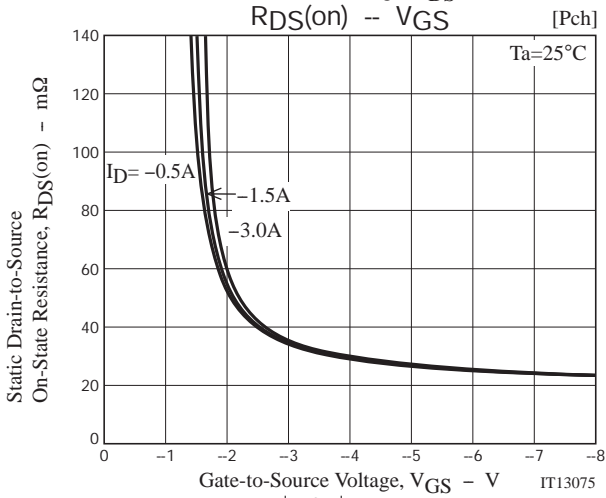
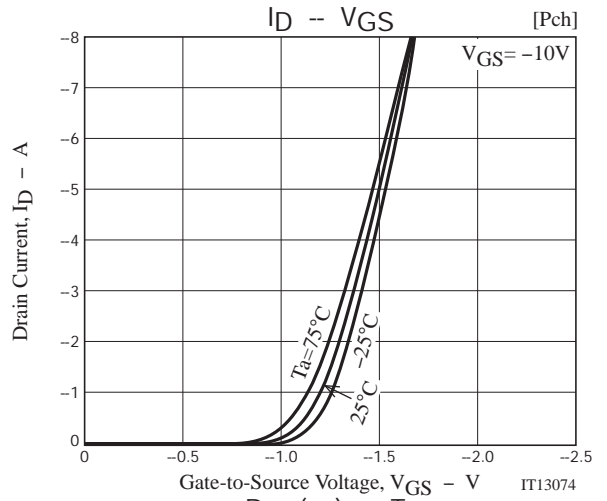
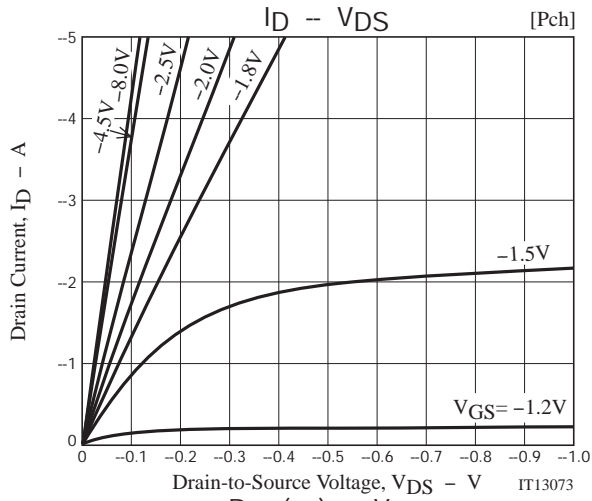
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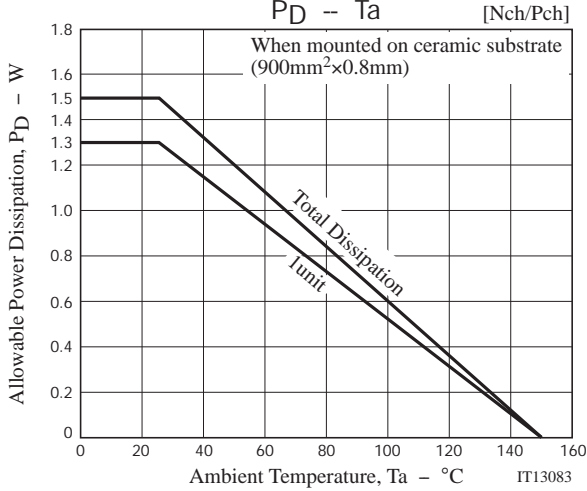
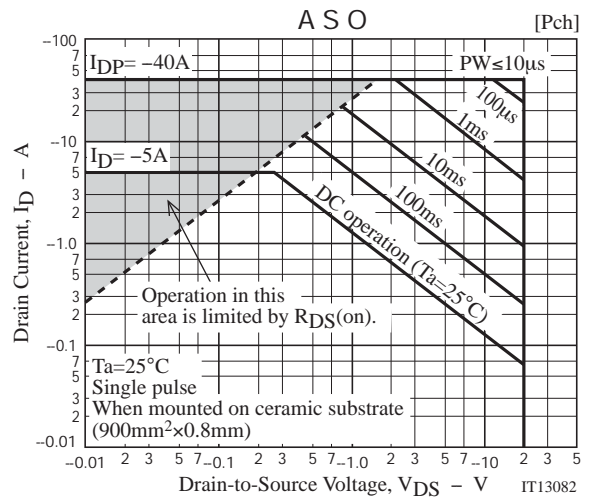
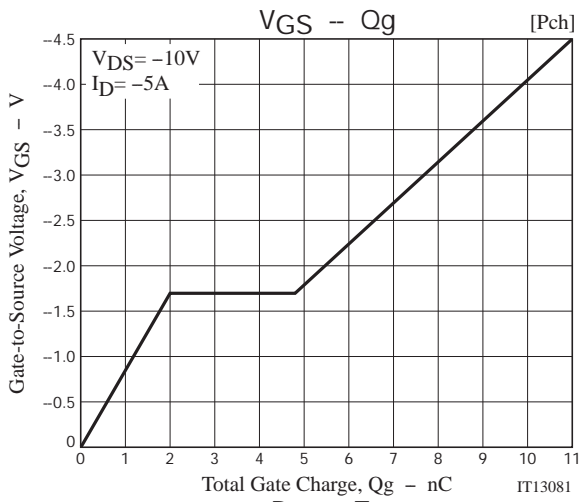


[P-channel]









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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