



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

N-Channel and P-Channel Silicon MOSFETs

ECH8660 — General-Purpose Switching Device Applications

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
- 4V 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}		30	-30	V
Gate-to-Source Voltage	V _{GSS}		±20	±20	V
Drain Current (DC)	I _D		4.5	-4.5	A
Drain Current (Pulse)	I _{DP}	PW≤10μs, duty cycle≤1%	30	-30	A
Allowable Power Dissipation	P _D	When mounted on ceramic substrate (1200mm ² ×0.8mm) 1unit	1.3		W
Total Dissipation	P _T	When mounted on ceramic substrate (1200mm 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	30			V
Zero-Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V			1	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	1.2		2.6	V

Marking : TF

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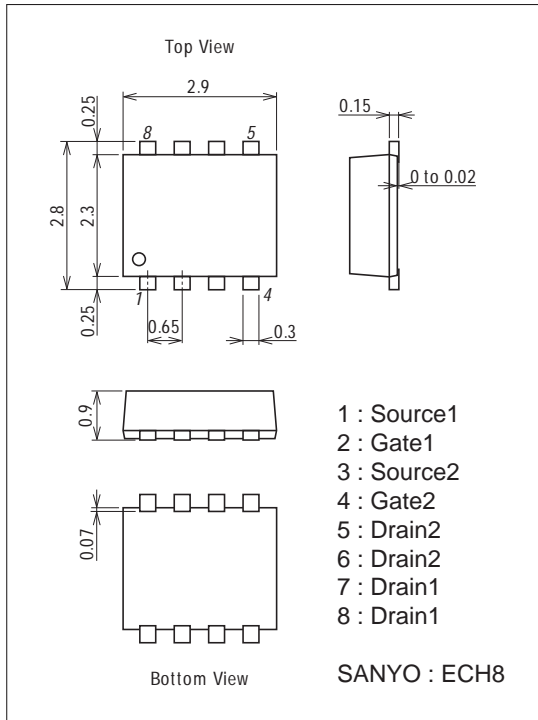
ECH8660

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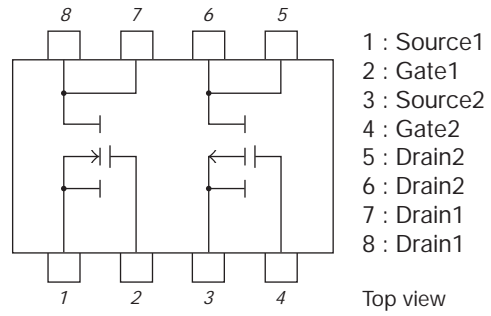
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Forward Transfer Admittance	yfs	V _{DS} =10V, I _D =2A	1	1.66		S
Static Drain-to-Source On-State Resistance	R _{DS(on)1}	I _D =2A, V _{GS} =10V		45	59	mΩ
	R _{DS(on)2}	I _D =1A, V _{GS} =4.5V		85	119	mΩ
	R _{DS(on)3}	I _D =1A, V _{GS} =4V		110	155	mΩ
Input Capacitance	C _{iss}	V _{DS} =10V, f=1MHz		240		pF
Output Capacitance	C _{oss}	V _{DS} =10V, f=1MHz		45		pF
Reverse Transfer Capacitance	C _{rss}	V _{DS} =10V, f=1MHz		30		pF
Turn-ON Delay Time	t _{d(on)}	See specified Test Circuit.		6.2		ns
Rise Time	t _r	See specified Test Circuit.		11		ns
Turn-OFF Delay Time	t _{d(off)}	See specified Test Circuit.		17		ns
Fall Time	t _f	See specified Test Circuit.		7.5		ns
Total Gate Charge	Q _g	V _{DS} =10V, V _{GS} =10V, I _D =4.5A		4.4		nC
Gate-to-Source Charge	Q _{gs}	V _{DS} =10V, V _{GS} =10V, I _D =4.5A		1.1		nC
Gate-to-Drain "Miller" Charge	Q _{gd}	V _{DS} =10V, V _{GS} =10V, I _D =4.5A		0.64		nC
Diode Forward Voltage	V _{SD}	I _S =4.5A, V _{GS} =0V		0.84	1.2	V
[P-channel]						
Drain-to-Source Breakdown Voltage	V(BR) _{DSS}	I _D =-1mA, V _{GS} =0V	-30			V
Zero-Gate Voltage Drain Current	I _{DSS}	V _{DS} =-30V, V _{GS} =0V			-1	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	-1.2		-2.3	V
Forward Transfer Admittance	yfs	V _{DS} =-10V, I _D =-2A	2.5	4.2		S
Static Drain-to-Source On-State Resistance	R _{DS(on)1}	I _D =-2A, V _{GS} =-10V		45	59	mΩ
	R _{DS(on)2}	I _D =-1A, V _{GS} =-4.5V		71	100	mΩ
	R _{DS(on)3}	I _D =-1A, V _{GS} =-4V		82	115	mΩ
Input Capacitance	C _{iss}	V _{DS} =-10V, f=1MHz		430		pF
Output Capacitance	C _{oss}	V _{DS} =-10V, f=1MHz		105		pF
Reverse Transfer Capacitance	C _{rss}	V _{DS} =-10V, f=1MHz		75		pF
Turn-ON Delay Time	t _{d(on)}	See specified Test Circuit.		7.5		ns
Rise Time	t _r	See specified Test Circuit.		26		ns
Turn-OFF Delay Time	t _{d(off)}	See specified Test Circuit.		45		ns
Fall Time	t _f	See specified Test Circuit.		35		ns
Total Gate Charge	Q _g	V _{DS} =-10V, V _{GS} =-10V, I _D =-4.5A		10		nC
Gate-to-Source Charge	Q _{gs}	V _{DS} =-10V, V _{GS} =-10V, I _D =-4.5A		2.0		nC
Gate-to-Drain "Miller" Charge	Q _{gd}	V _{DS} =-10V, V _{GS} =-10V, I _D =-4.5A		2.5		nC
Diode Forward Voltage	V _{SD}	I _S =-4.5A, V _{GS} =0V		-0.85	-1.2	V

Package Dimensions

unit : mm (typ)
7011A-001

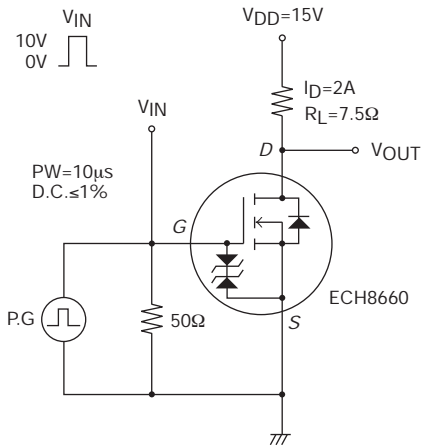


Electrical Connection

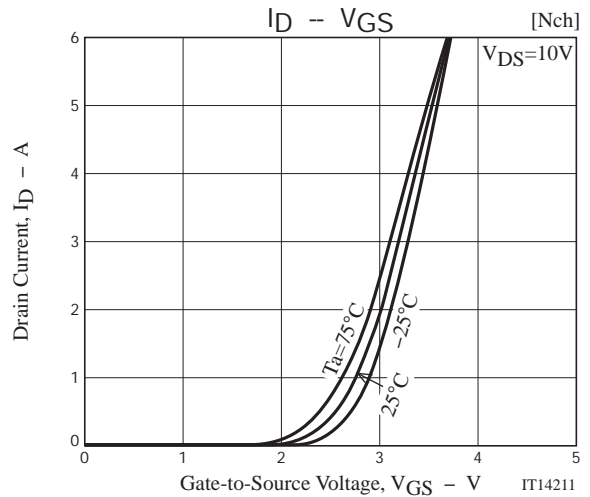
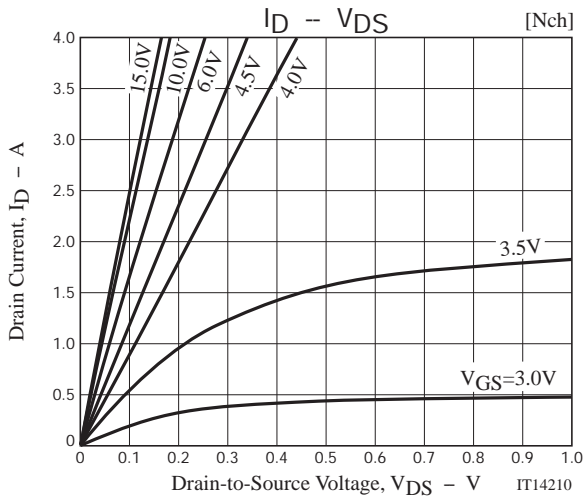
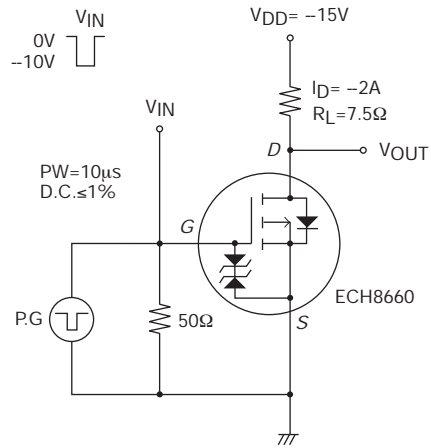


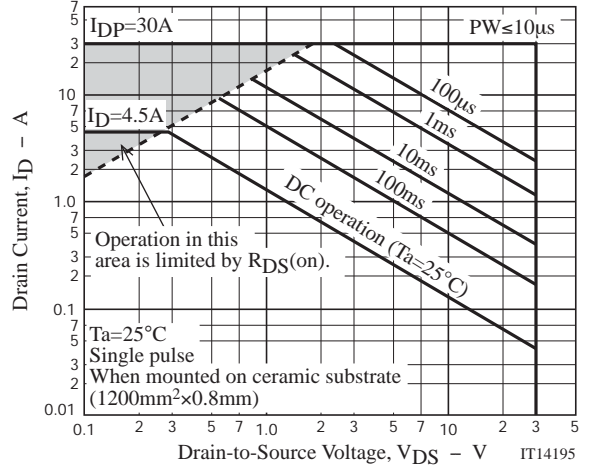
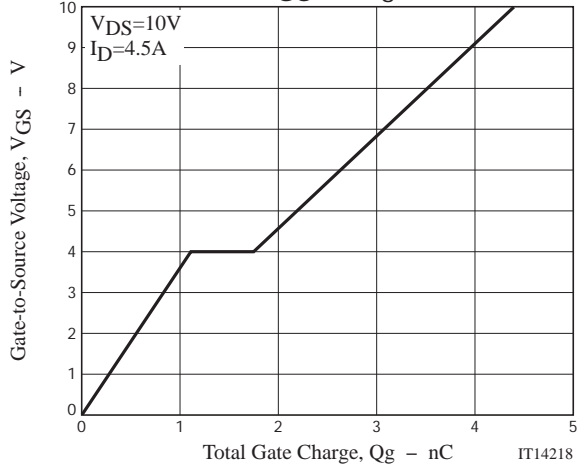
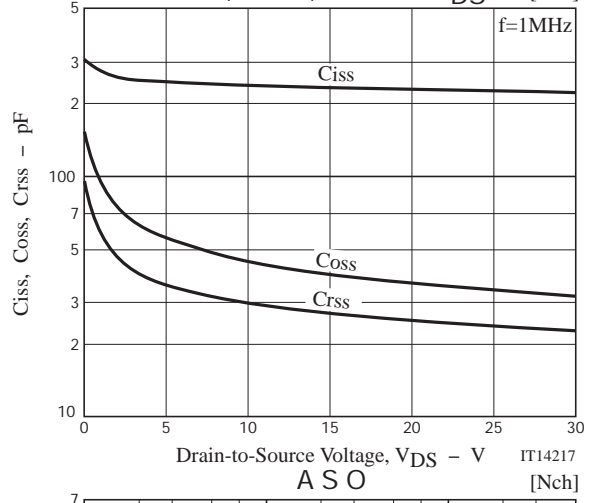
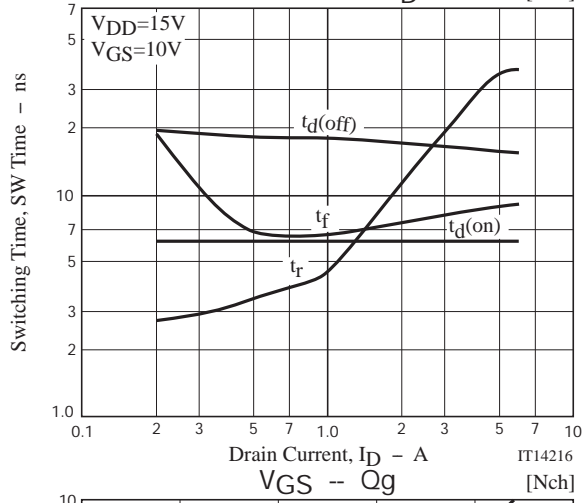
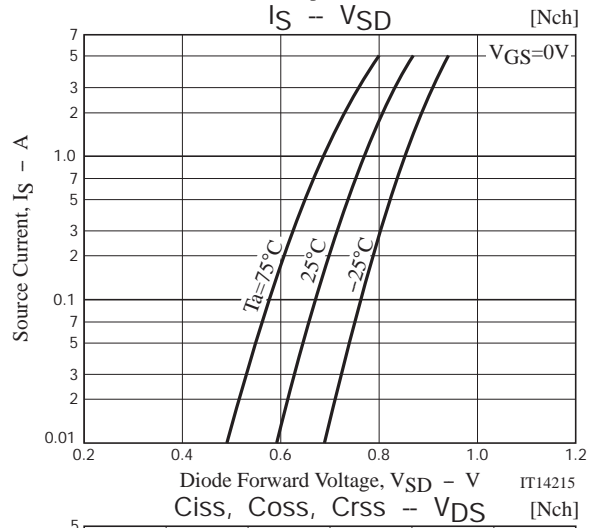
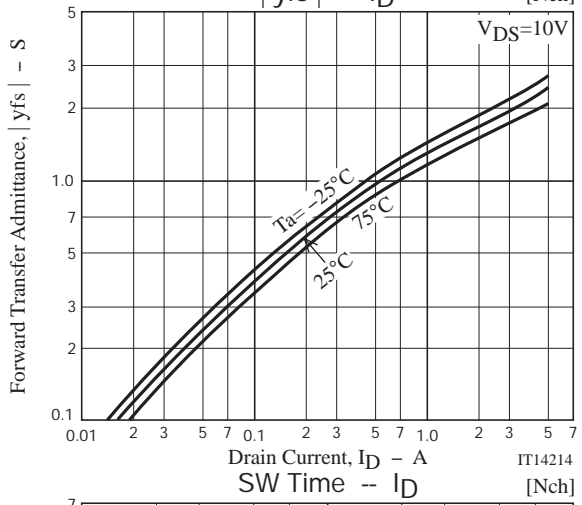
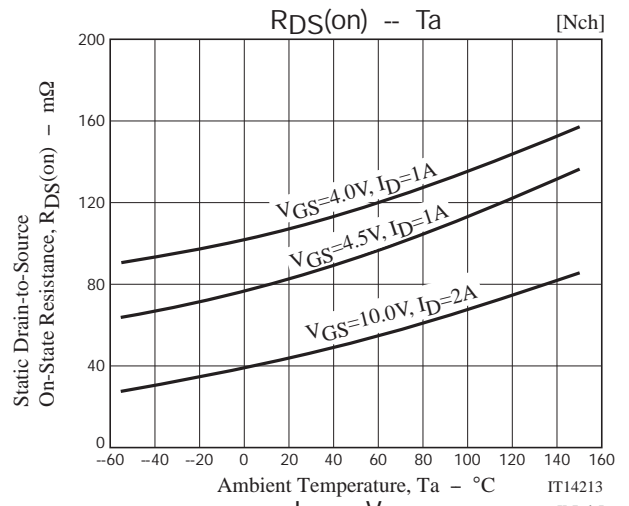
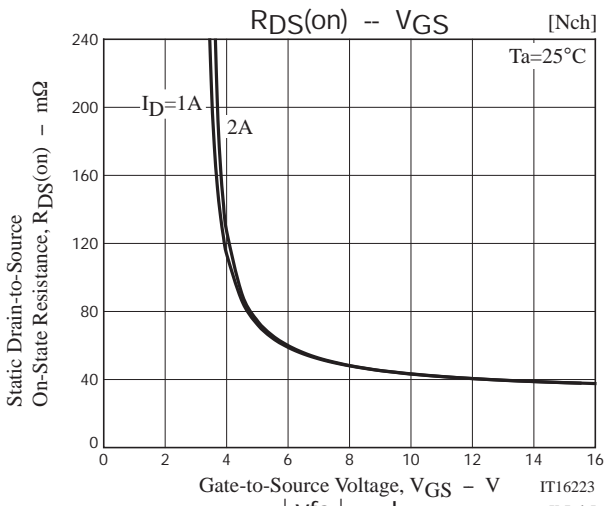
Switching Time Test Circuit

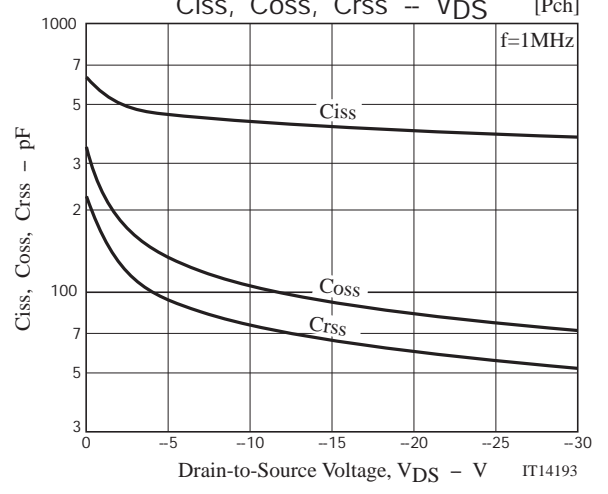
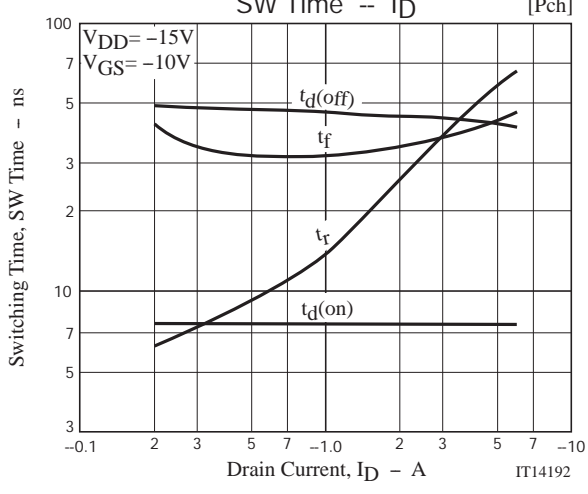
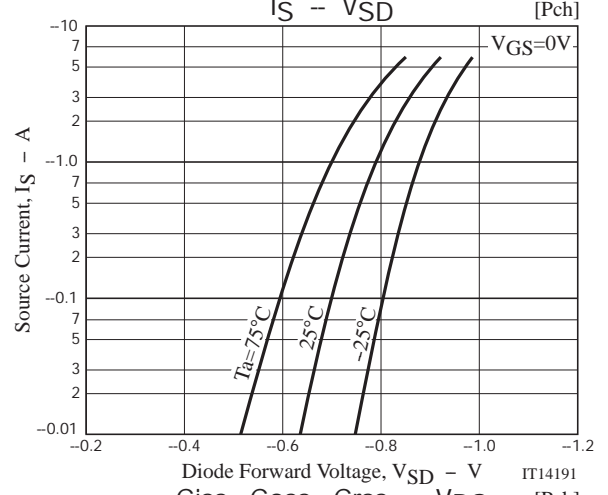
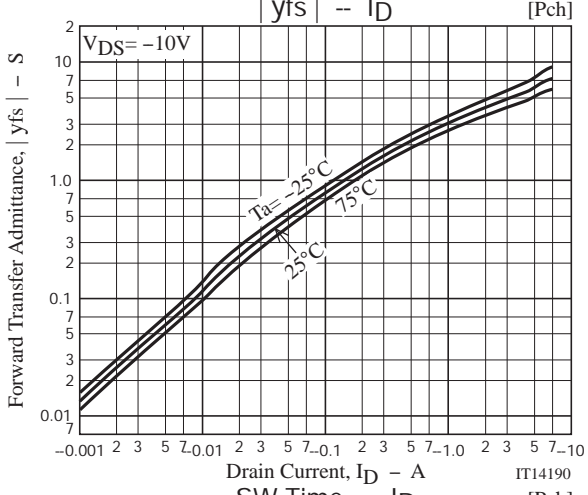
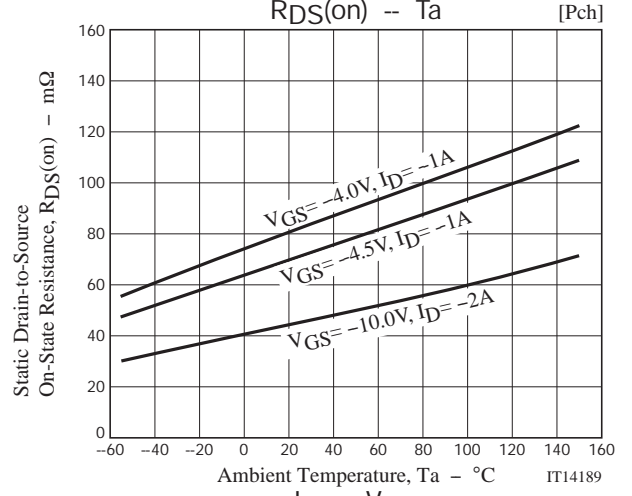
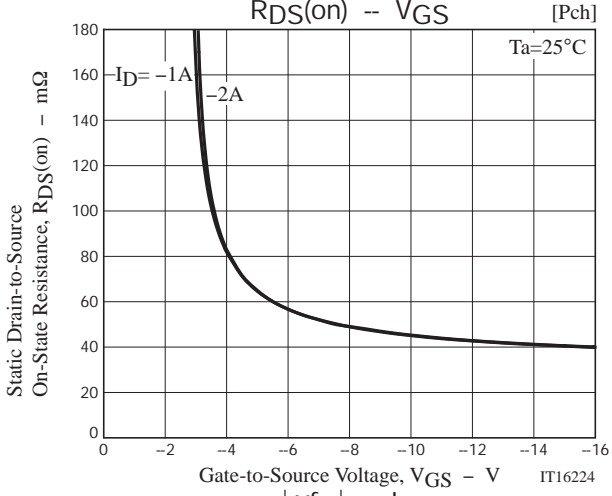
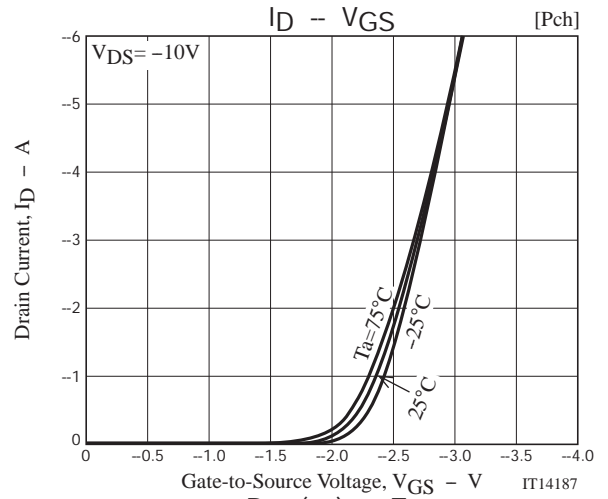
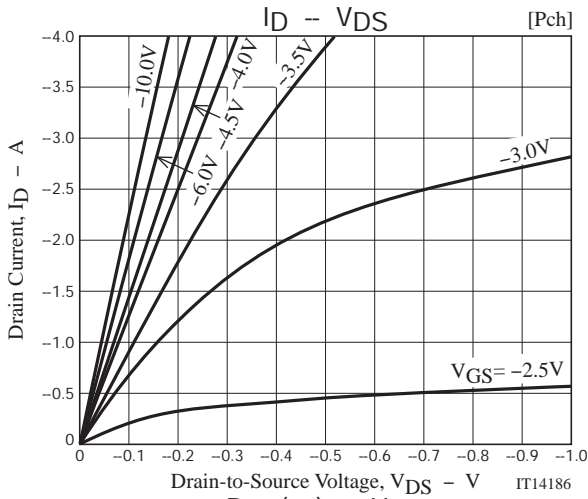
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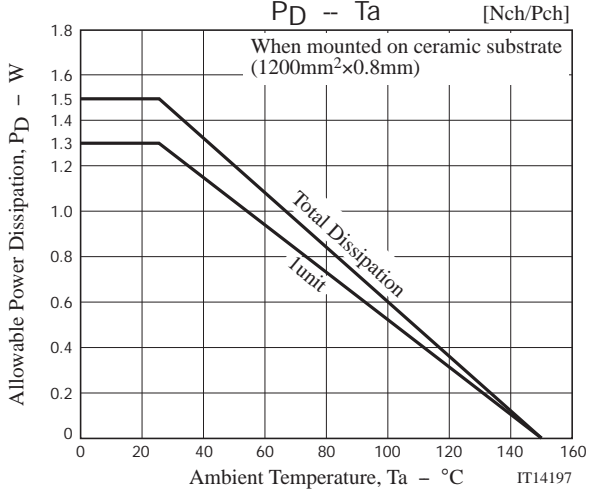
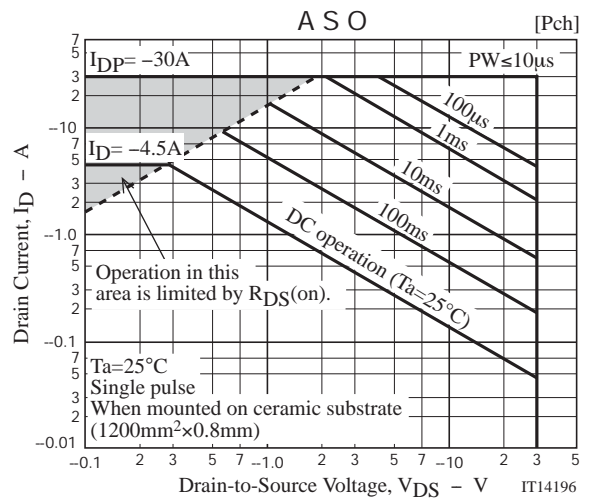
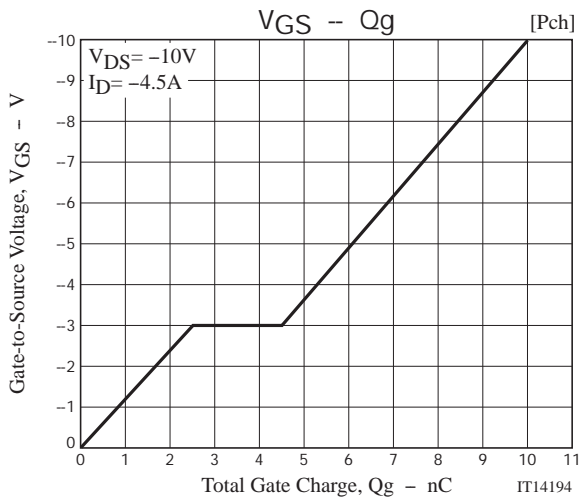


[P-channel]









Note on usage : Since the ECH8660 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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