



ON Semiconductor®

ON Semiconductor DATA SHEET

ECH8619 — N-Channel and P-Channel Silicon MOSFETs General-Purpose Switching Device Applications

Features

- The ECH8619 incorporates an N-channel MOSFET and a P-channel MOSFET that feature low ON-resistance and ultrahigh-speed switching, thereby enabling high-density mounting.
- 4V drive.

Specifications

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

Parameter	Symbol	Conditions	N-channel	P-channel	Unit
Drain-to-Source Voltage	V_{DS}		60	-60	V
Gate-to-Source Voltage	V_{GS}		± 20	± 20	V
Drain Current (DC)	I_D		3	-2	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	20	-20	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (900mm ² ×0.8mm) 1unit	1.3		W
Total Dissipation	P_T	Mounted on a ceramic board (900mm ² ×0.8mm)	1.5		W
Channel Temperature	T_{ch}		150		$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150		$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[N-channel]						
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	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 16\text{V}$, $V_{DS}=0\text{V}$			± 10	μA
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} $	$V_{DS}=10\text{V}$, $I_D=1.5\text{A}$	2.2	3.8		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=1.5\text{A}$, $V_{GS}=10\text{V}$		70	93	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=0.5\text{A}$, $V_{GS}=4\text{V}$		92	133	$\text{m}\Omega$

Marking : FM

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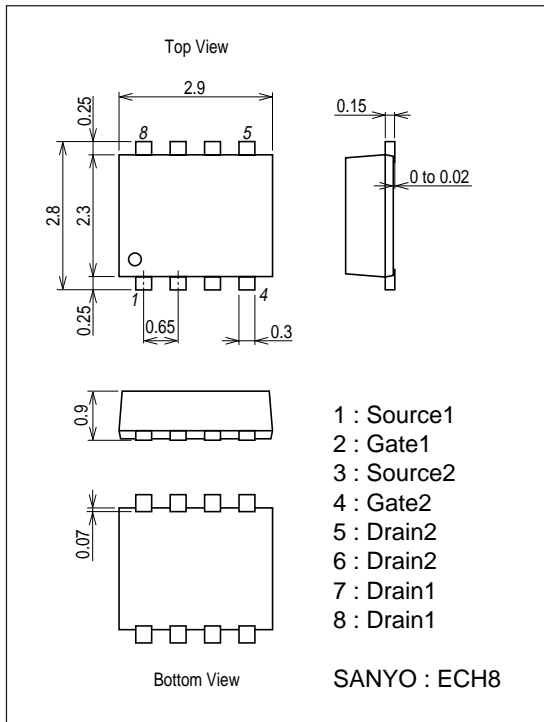
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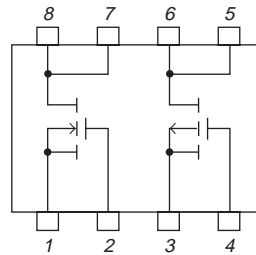
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V _{DS} =20V, f=1MHz		560		pF
Output Capacitance	Coss	V _{DS} =20V, f=1MHz		60		pF
Reverse Transfer Capacitance	Crss	V _{DS} =20V, f=1MHz		41		pF
Turn-ON Delay Time	t _{d(on)}	See specified Test Circuit.		11		ns
Rise Time	t _r	See specified Test Circuit.		11		ns
Turn-OFF Delay Time	t _{d(off)}	See specified Test Circuit.		61		ns
Fall Time	t _f	See specified Test Circuit.		32		ns
Total Gate Charge	Qg	V _{DS} =30V, V _{GS} =10V, I _D =3A		12.8		nC
Gate-to-Source Charge	Qgs	V _{DS} =30V, V _{GS} =10V, I _D =3A		2.1		nC
Gate-to-Drain "Miller" Charge	Qgd	V _{DS} =30V, V _{GS} =10V, I _D =3A		2.7		nC
Diode Forward Voltage	V _{SD}	I _S =3A, V _{GS} =0V		0.81	1.2	V
[P-channel]						
Drain-to-Source Breakdown Voltage	V _{(BR)DSS}	I _D =-1mA, V _{GS} =0V	-60			V
Zero-Gate Voltage Drain Current	I _{DSS}	V _{DS} =-60V, 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
Forward Transfer Admittance	y _{fs}	V _{DS} =-10V, I _D =-1A	2.1	3.5		S
Static Drain-to-Source On-State Resistance	R _{DS(on)1}	I _D =-1A, V _{GS} =-10V		160	210	mΩ
	R _{DS(on)2}	I _D =-0.5A, V _{GS} =-4V		210	295	mΩ
Input Capacitance	Ciss	V _{DS} =-20V, f=1MHz		660		pF
Output Capacitance	Coss	V _{DS} =-20V, f=1MHz		54		pF
Reverse Transfer Capacitance	Crss	V _{DS} =-20V, f=1MHz		42		pF
Turn-ON Delay Time	t _{d(on)}	See specified Test Circuit.		10.5		ns
Rise Time	t _r	See specified Test Circuit.		7.0		ns
Turn-OFF Delay Time	t _{d(off)}	See specified Test Circuit.		93		ns
Fall Time	t _f	See specified Test Circuit.		30		ns
Total Gate Charge	Qg	V _{DS} =-30V, V _{GS} =-10V, I _D =-2A		15		nC
Gate-to-Source Charge	Qgs	V _{DS} =-30V, V _{GS} =-10V, I _D =-2A		2.1		nC
Gate-to-Drain "Miller" Charge	Qgd	V _{DS} =-30V, V _{GS} =-10V, I _D =-2A		2.7		nC
Diode Forward Voltage	V _{SD}	I _S =-2A, V _{GS} =0V		-0.82	-1.2	V

Package Dimensions

unit : mm (typ)
7011A-001



Electrical Connection



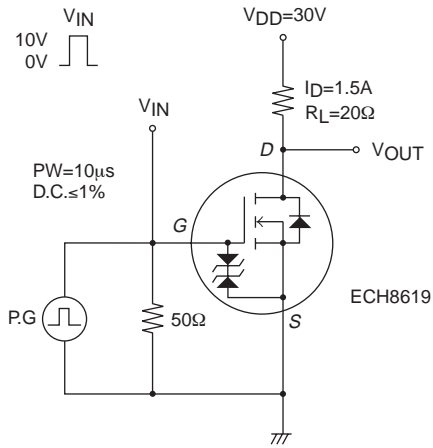
- 1 : Source1
- 2 : Gate1
- 3 : Source2
- 4 : Gate2
- 5 : Drain2
- 6 : Drain2
- 7 : Drain1
- 8 : Drain1

Top view

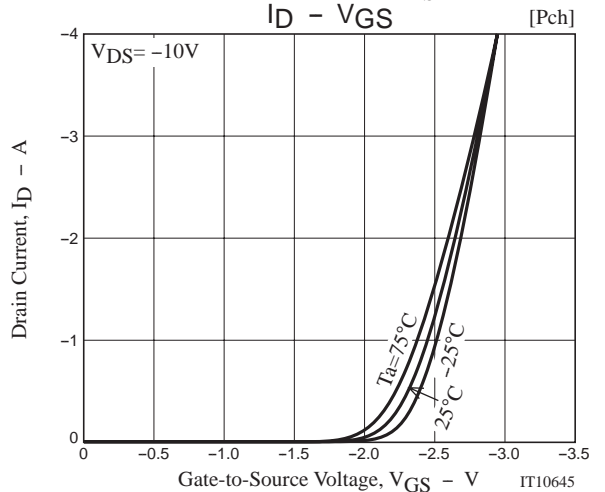
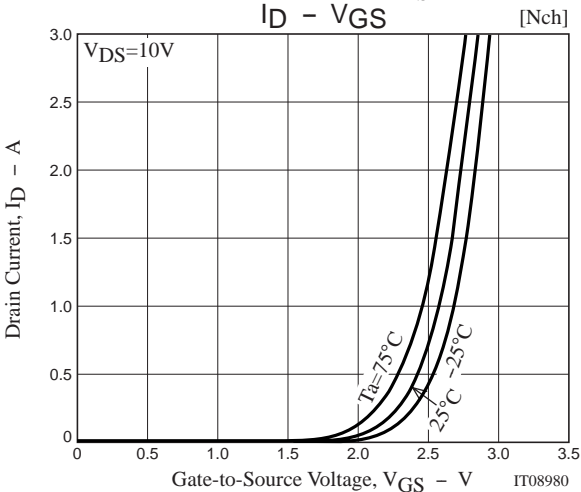
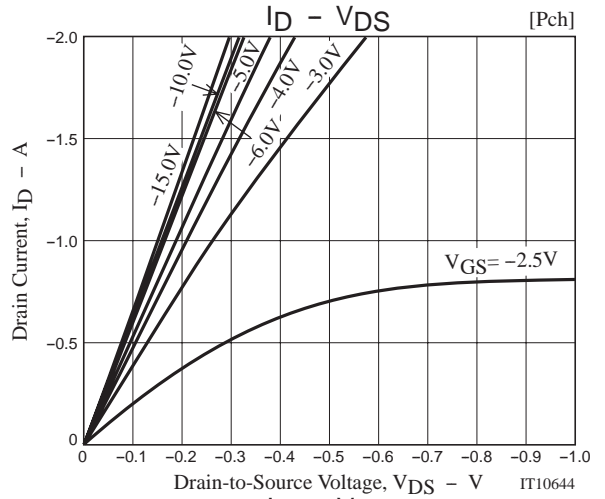
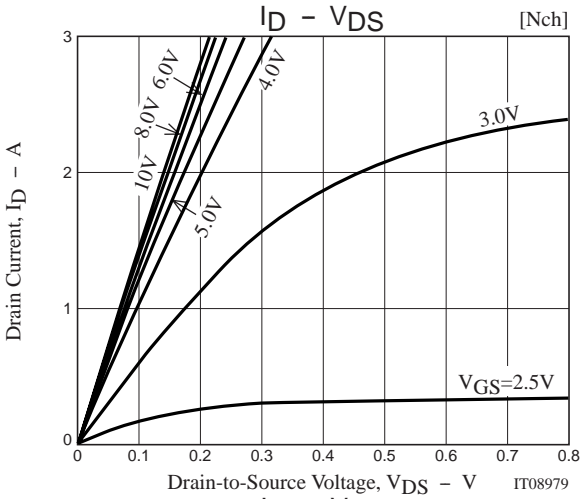
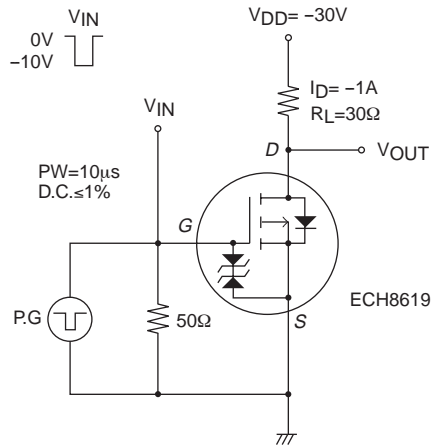
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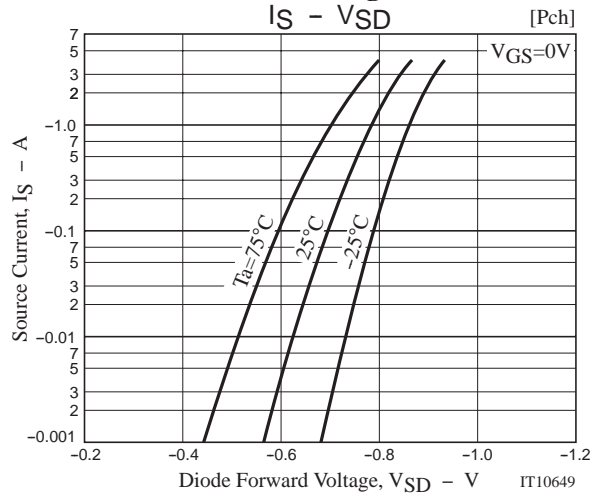
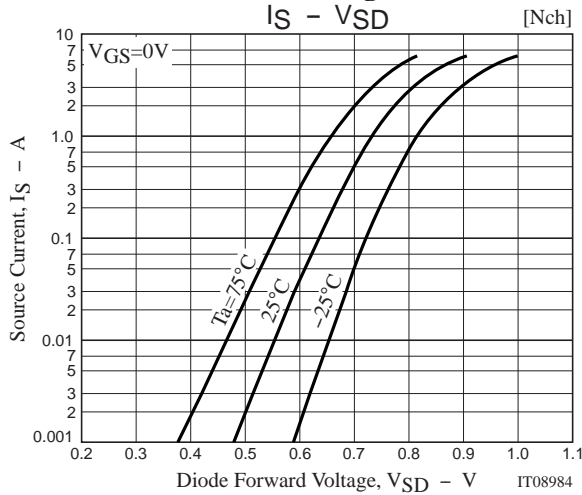
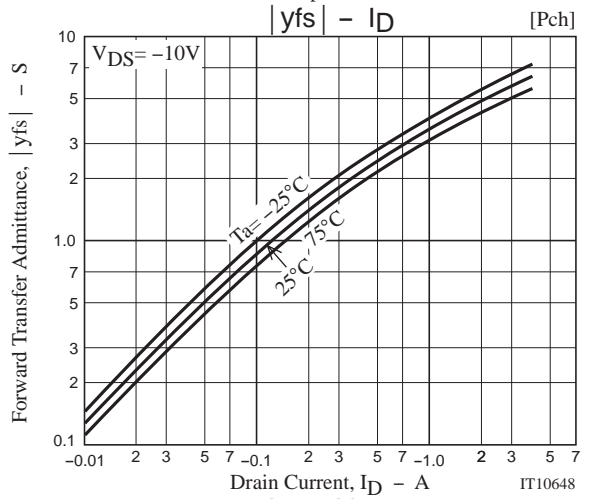
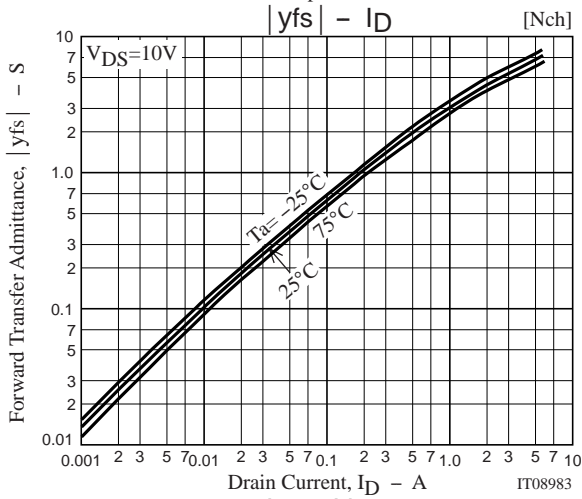
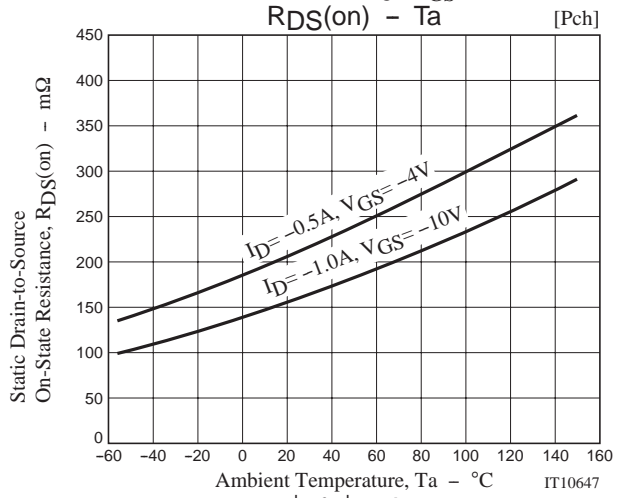
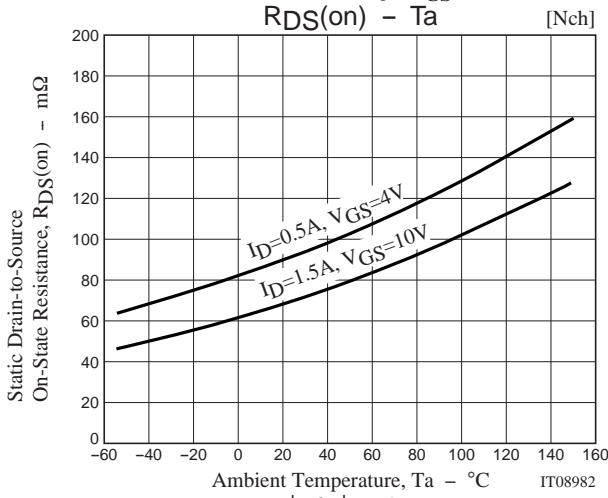
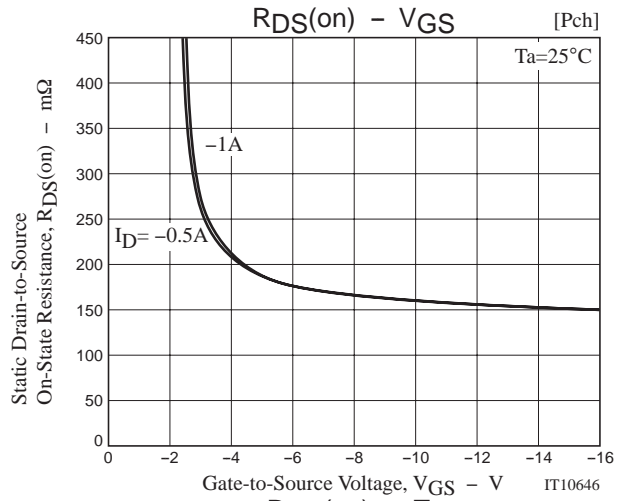
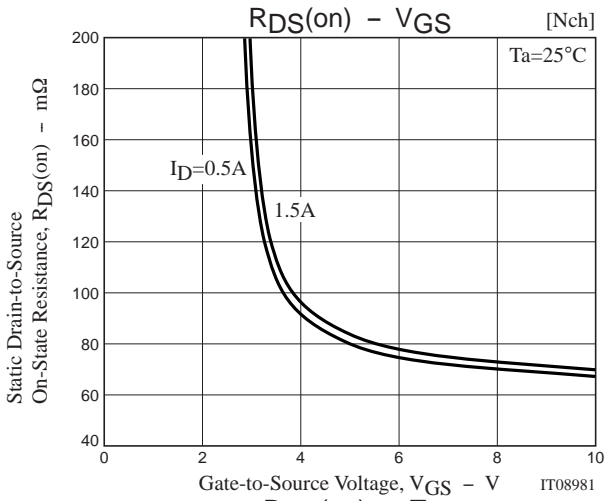
Switching Time Test Circuit

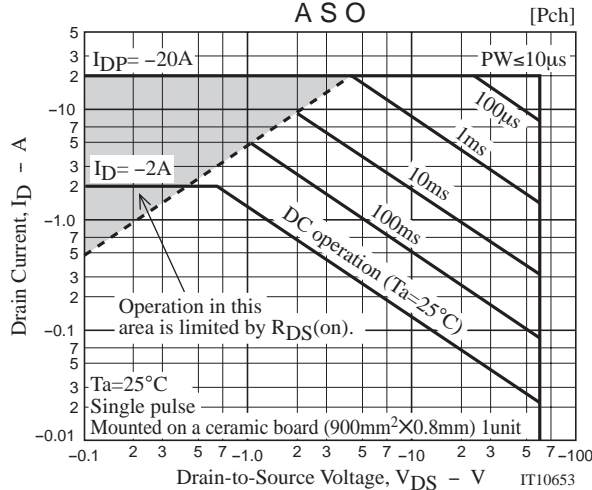
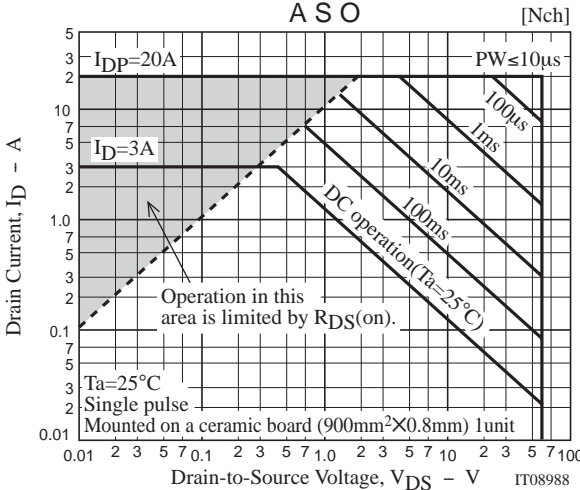
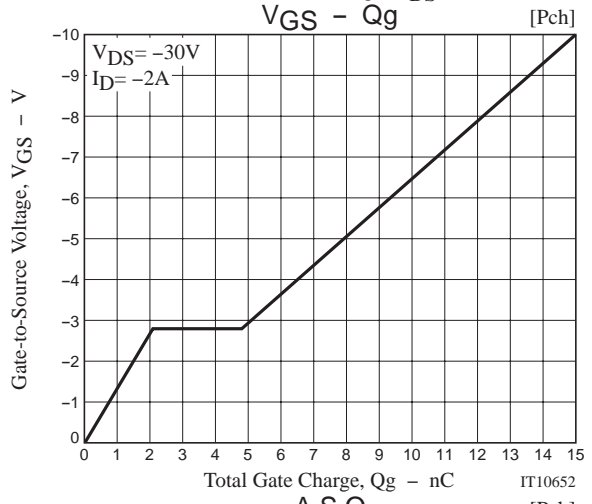
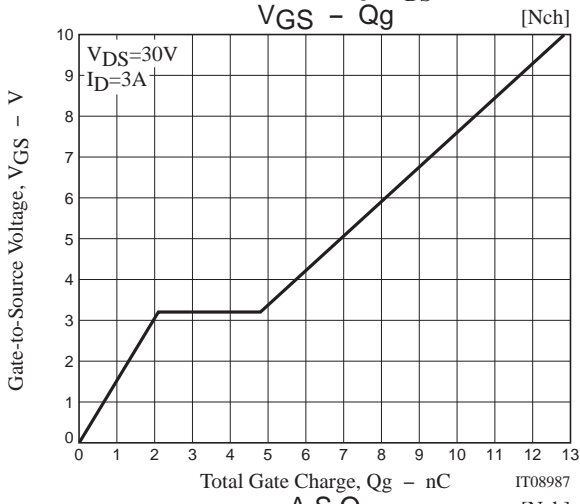
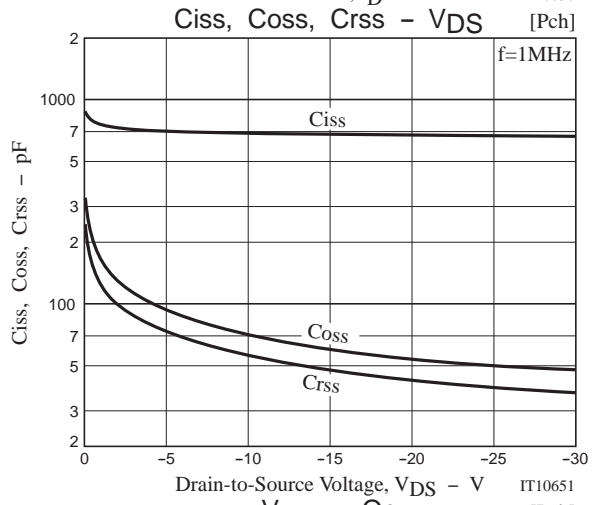
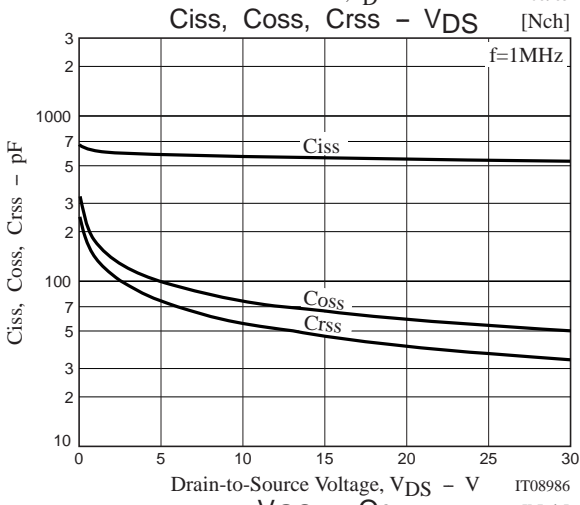
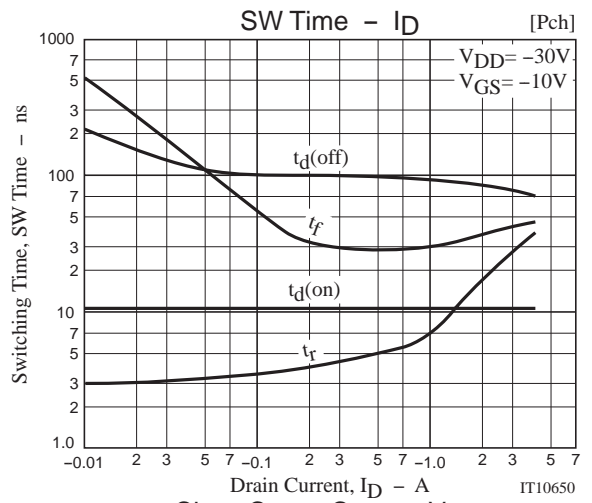
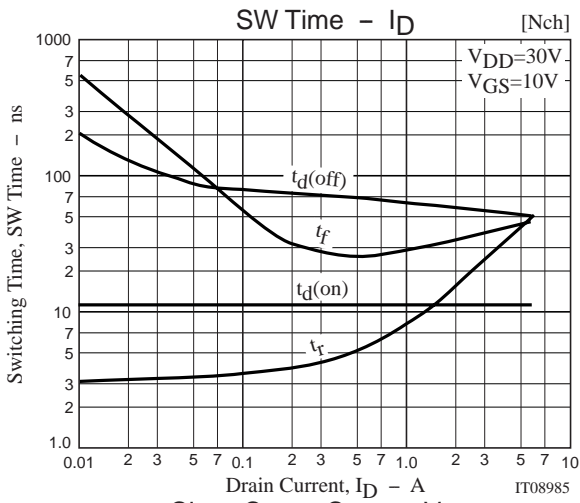
[N-channel]

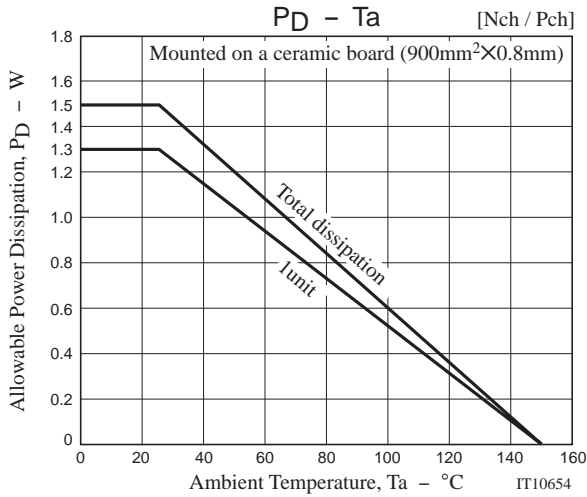


[P-channel]









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