

**FW352**

Ultrahigh-Speed Switching Applications

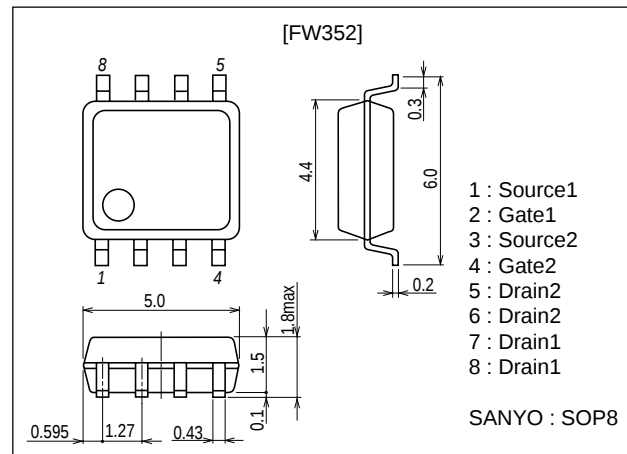
Features

- Low ON-resistance.
- Ultrahigh-speed switching.
- Dual chip device with both a p-channel and an n-channel MOSFETs encapsulated in one package for high-density mounting.
- High-density mounting.
- Excellent ON-resistance characteristic.

Package Dimensions

unit : mm

2129



Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings		Unit
			N-channel	P-channel	
Drain-to-Source Voltage	V_{DSS}		60	-60	V
Gate-to-Source Voltage	V_{GSS}		± 20	± 20	V
Drain Current (DC)	I_D		4	-2.4	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu s$, duty cycle $\leq 1\%$	48	-32	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (1200mm ² ×0.8mm)1unit	1.7		W
Total Dissipation	P_T	Mounted on a ceramic board (1200mm ² ×0.8mm)	2.0		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	ID=1mA, VGS=0	60			V
Zero-Gate Voltage Drain Current	IDSS	VDS=60V, VGS=0			10	μA
Gate-to-Source Leakage Current	IGSS	VGS=±16V, VDS=0			±10	μA
Cutoff Voltage	VGS(off)	VDS=10V, ID=1mA	1.0		2.4	V
Forward Transfer Admittance	yfs	VDS=10V, ID=4A	5	7		S

Marking : W352

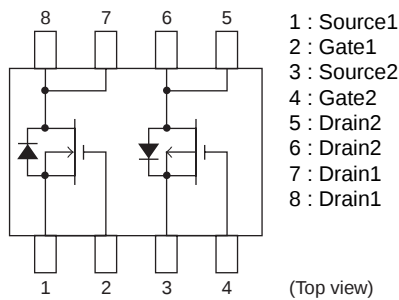
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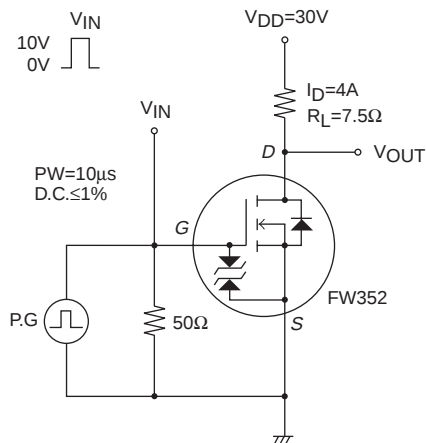
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=4A, V_{GS}=10V$		70	90	$m\Omega$
	$R_{DS(on)2}$	$I_D=2A, V_{GS}=4V$		90	125	$m\Omega$
Input Capacitance	C_{iss}	$V_{DS}=20V, f=1MHz$		350		pF
Output Capacitance	C_{oss}	$V_{DS}=20V, f=1MHz$		110		pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=20V, f=1MHz$		35		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		9		ns
Rise Time	t_r	See specified Test Circuit.		40		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit.		40		ns
Fall Time	t_f	See specified Test Circuit.		55		ns
Total Gate Charge	Q_g	$V_{DS}=10V, V_{GS}=10V, I_D=4A$		12		nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=10V, V_{GS}=10V, I_D=4A$		2		nC
Gate-to-Drain "Miller" Charge	Q_{gd}	$V_{DS}=10V, V_{GS}=10V, I_D=4A$		3		nC
Diode Forward Voltage	V_{SD}	$I_S=4A, V_{GS}=0$		0.81	1.2	V
[P-channel]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=-1mA, V_{GS}=0$	-60			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-60V, V_{GS}=0$			-10	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 16V, V_{DS}=0$			± 10	μA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=-10V, I_D=-1mA$	-1.0		-2.4	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=-10V, I_D=-2.4A$	3.2	4.6		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=-2.4A, V_{GS}=-10V$		165	215	$m\Omega$
	$R_{DS(on)2}$	$I_D=-1.2A, V_{GS}=-4V$		230	320	$m\Omega$
Input Capacitance	C_{iss}	$V_{DS}=-20V, f=1MHz$		440		pF
Output Capacitance	C_{oss}	$V_{DS}=-20V, f=1MHz$		110		pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=-20V, f=1MHz$		33		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		10		ns
Rise Time	t_r	See specified Test Circuit.		24		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit.		50		ns
Fall Time	t_f	See specified Test Circuit.		40		ns
Total Gate Charge	Q_g	$V_{DS}=-10V, V_{GS}=-10V, I_D=-2.4A$		14		nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=-10V, V_{GS}=-10V, I_D=-2.4A$		2		nC
Gate-to-Drain "Miller" Charge	Q_{gd}	$V_{DS}=-10V, V_{GS}=-10V, I_D=-2.4A$		3.7		nC
Diode Forward Voltage	V_{SD}	$I_S=-2.4A, V_{GS}=0$		-0.81	-1.2	V

Electrical Connection

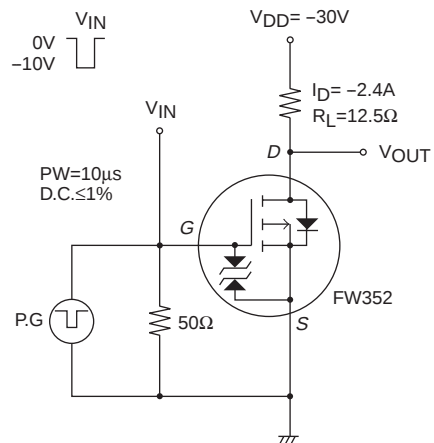


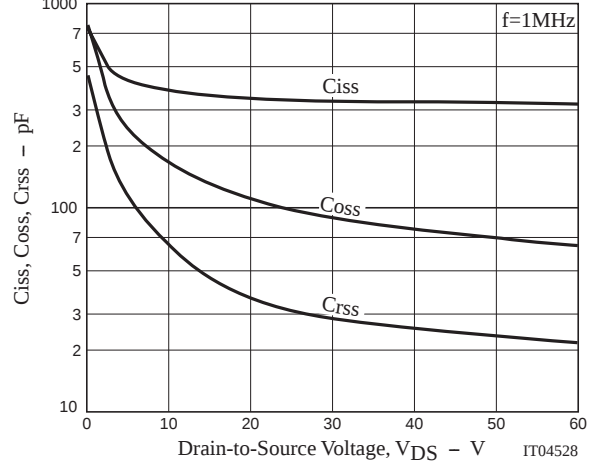
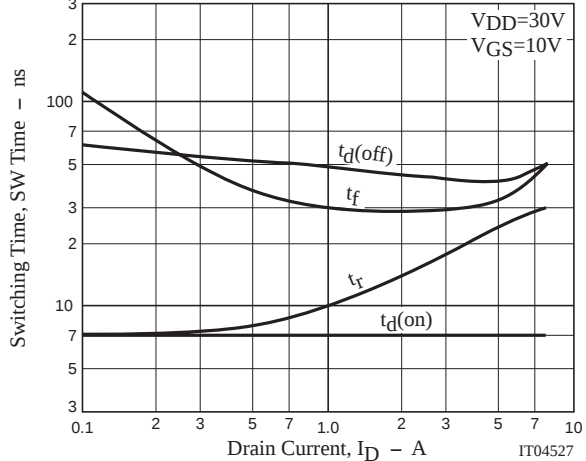
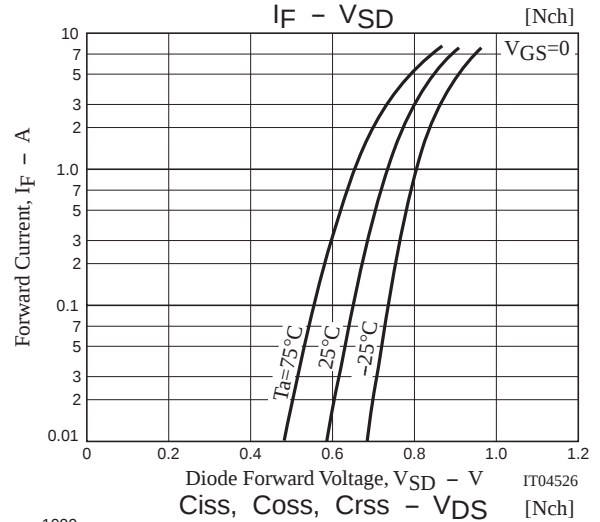
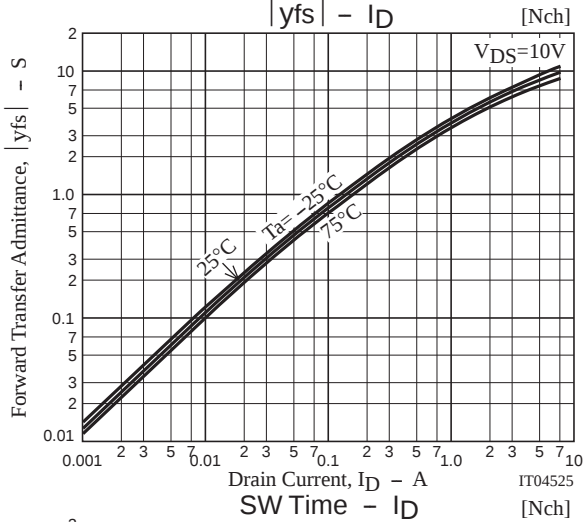
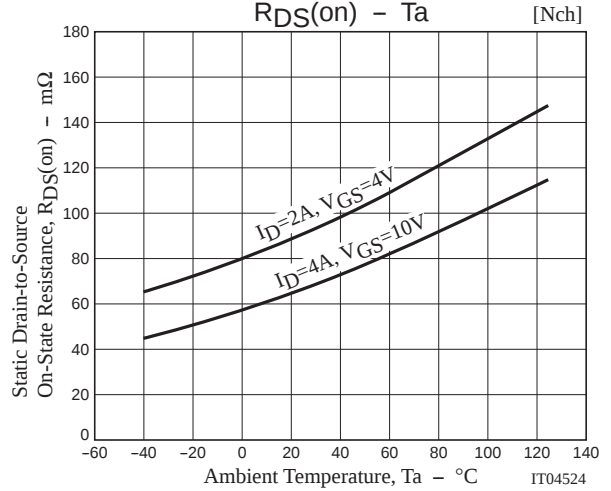
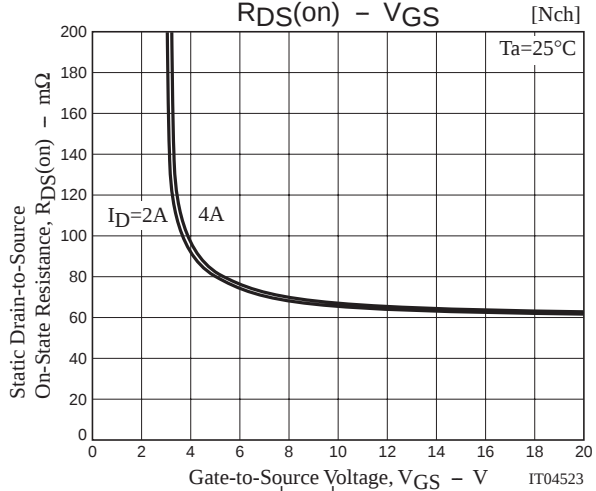
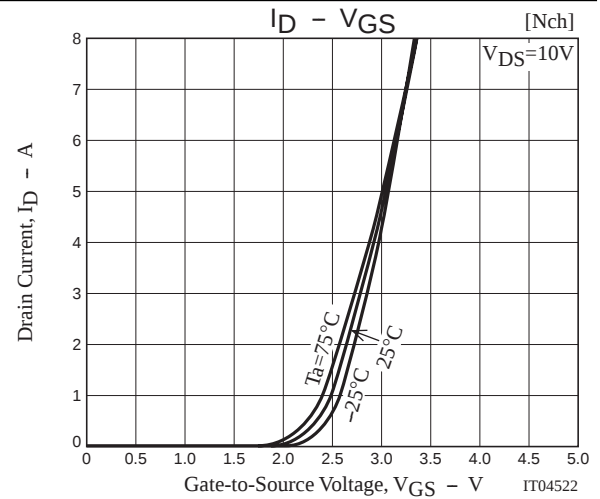
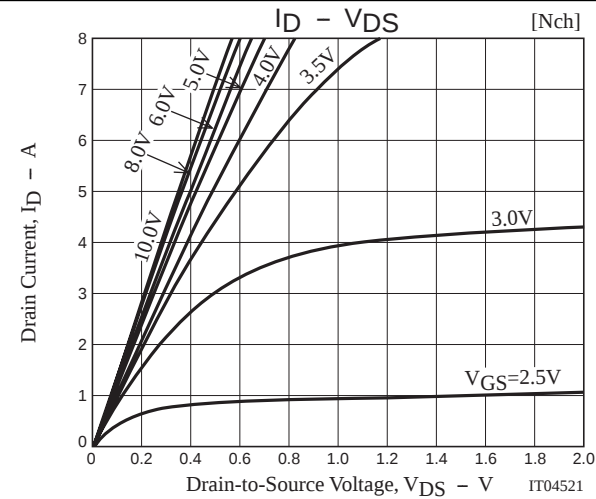
Switching Time Test Circuit

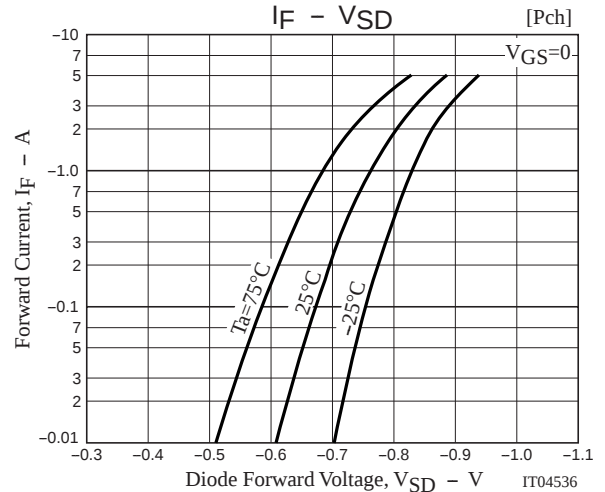
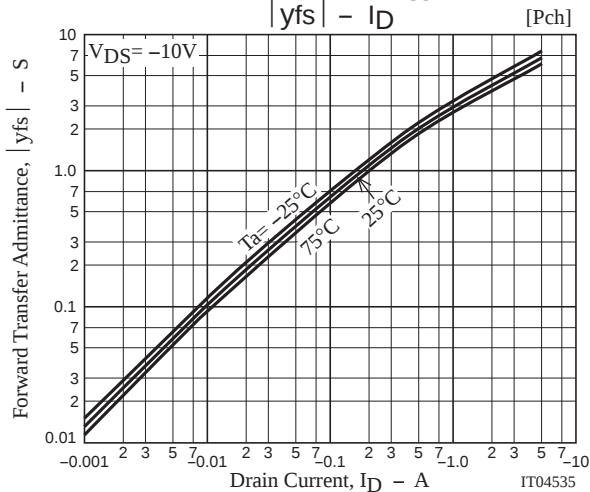
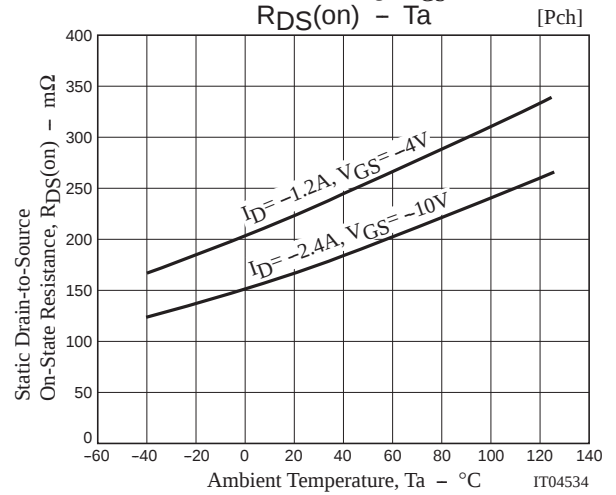
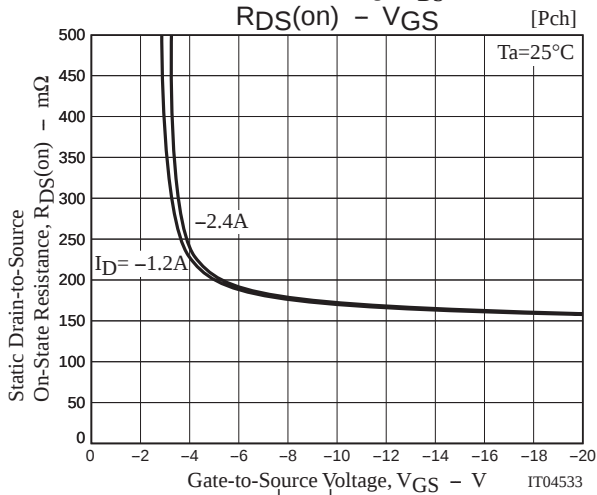
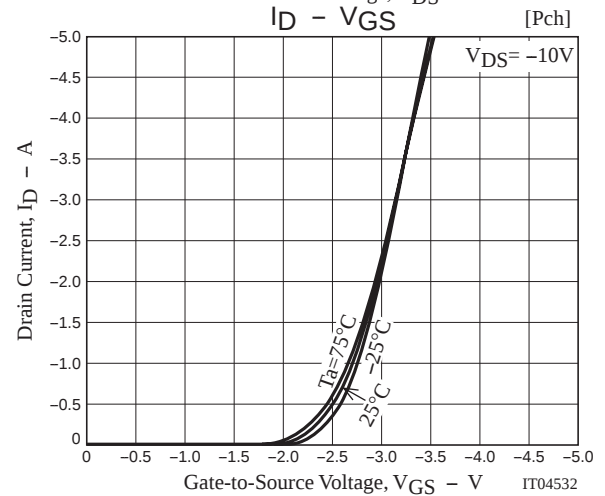
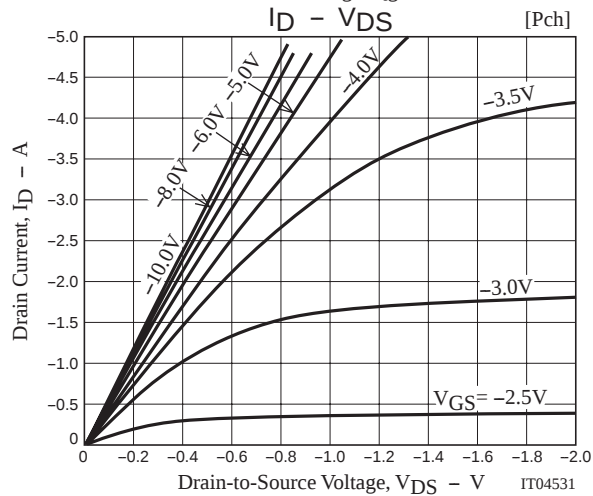
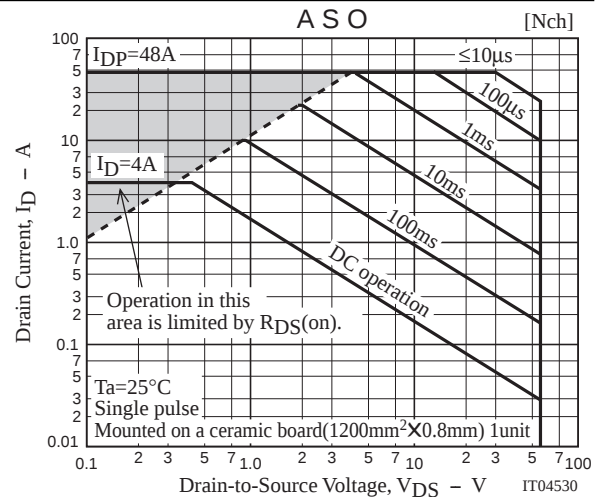
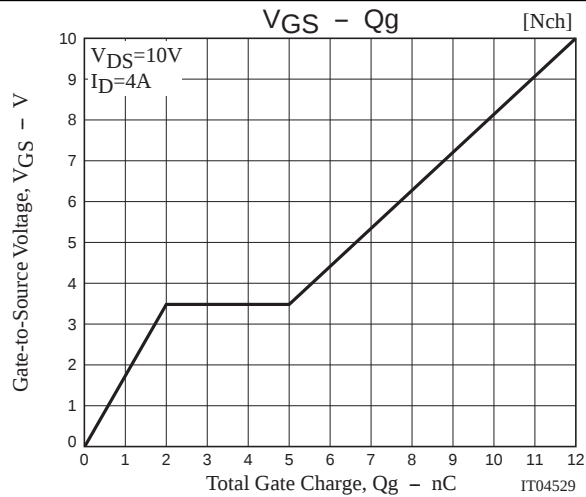
[N-channel]

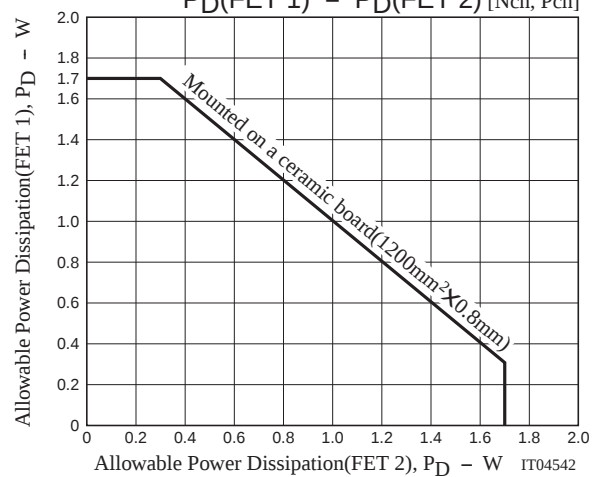
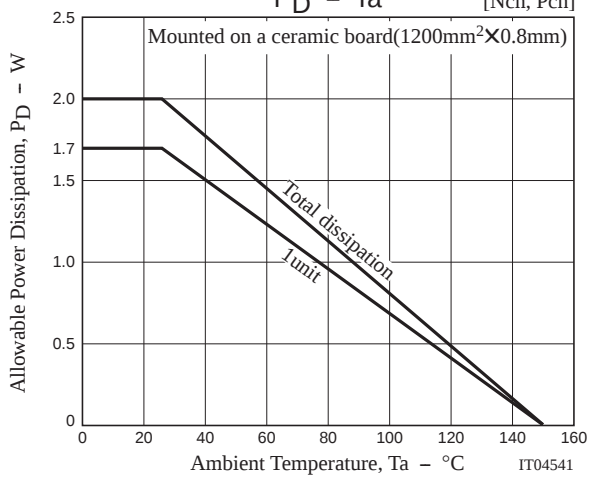
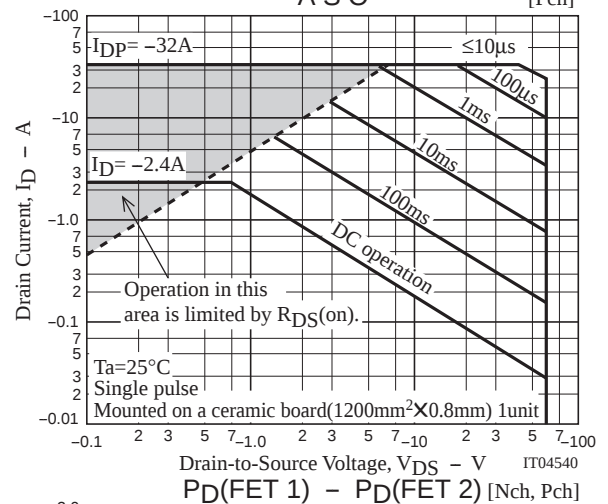
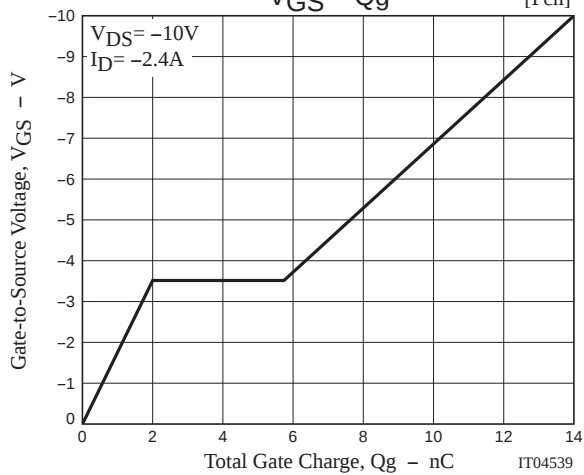
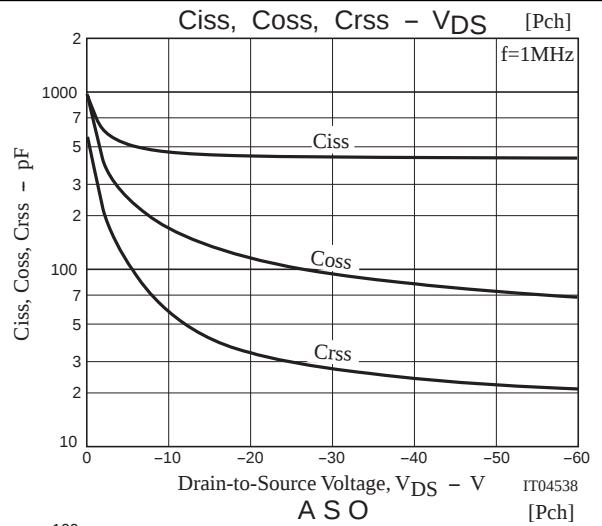
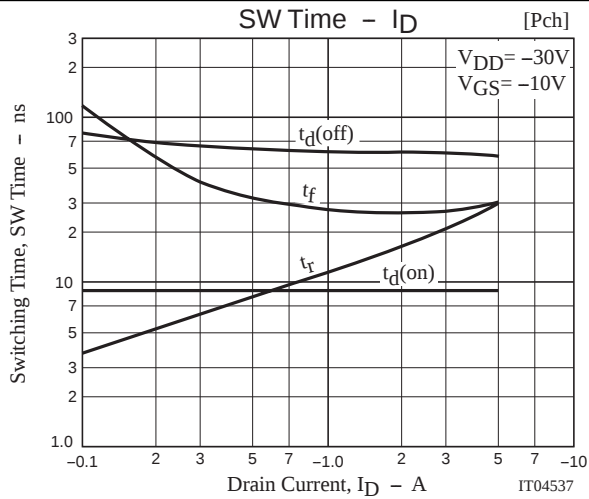


[P-channel]









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