Ordering number : ENN6680

N-Channel Silicon MOSFET

2SK3278

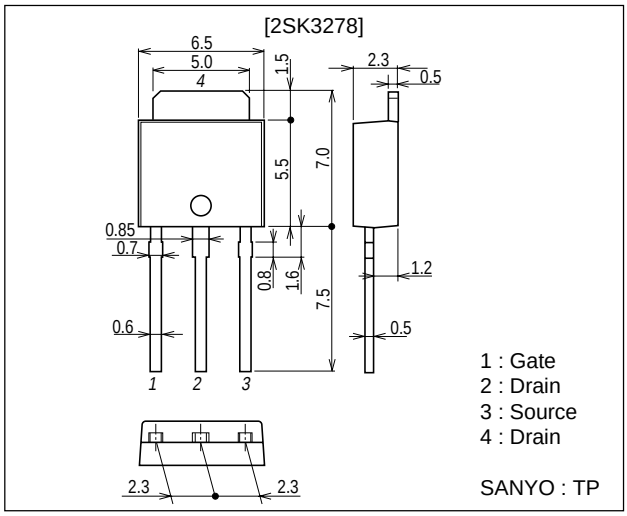
DC/DC Converter Applications

Features

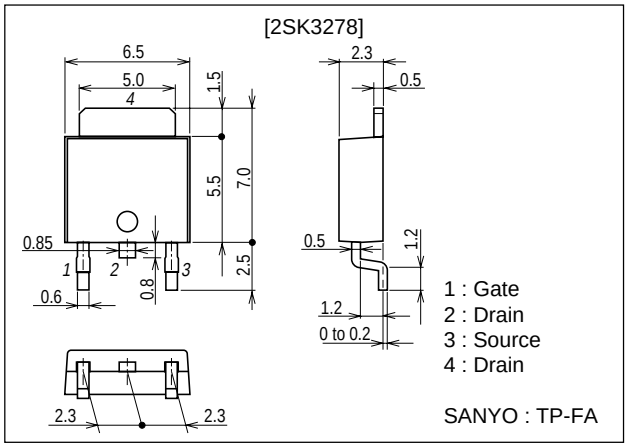
- Low ON-resistance.
- 4V drive.
- Ultrahigh-speed switching.

Package Dimensions

unit : mm
2083B



unit : mm
2092B



Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		30	V
Gate-to-Source Voltage	V_{GSS}		±20	V

Continued on next page.

Continued from preceding page.

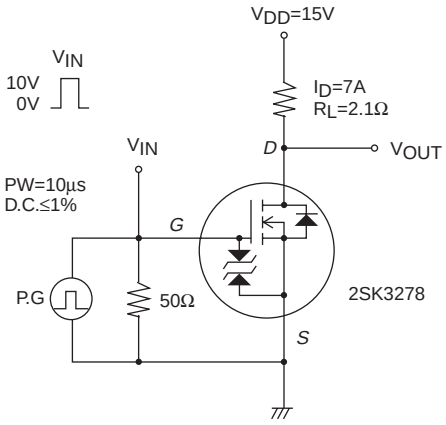
Parameter	Symbol	Conditions	Ratings	Unit
Drain Current (DC)	I_D		15	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	45	A
Allowable Power Dissipation	P_D		1	W
		Tc=25°C	15	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		-55 to +150	°C

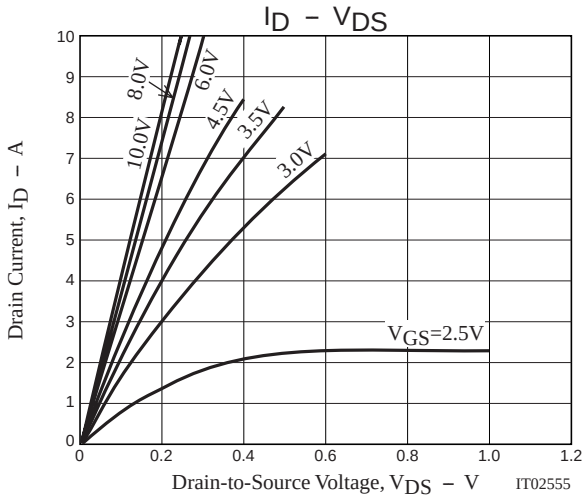
Electrical Characteristics at Ta=25°C

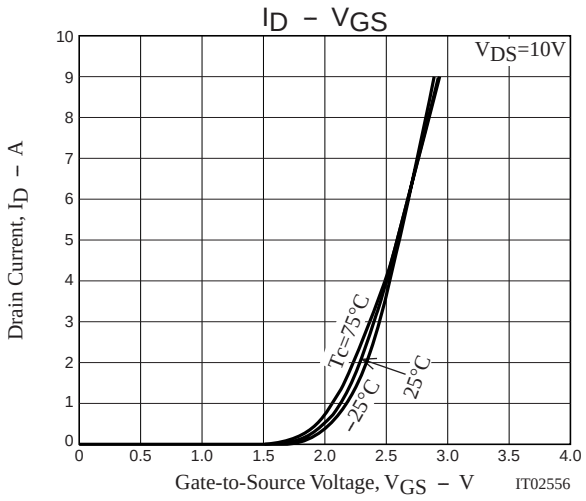
Parameter	Symbol	Conditions	Rathings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	1.0		2.4	V
Forward Transfer Admittance	|yfs|	V_{DS}=10V, I_D=7A	7	10		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=7A, V_{GS}=10V		27	36	mΩ
	R_{DS}(on)2	I_D=4A, V_{GS}=4.5V		40	56	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		530		pF
Output Capacitance	Coss	V_{DS}=10V, f=1MHz		170		pF
Reverse Transfer Capacitance	Crss	V_{DS}=10V, f=1MHz		90		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit		9		ns
Rise Time	t_r	See specified Test Circuit		130		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit		40		ns
Fall Time	t_f	See specified Test Circuit		60		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=10V, I_D=15A		10		nC
Gate-to-Source Charge	Qgs	V_{DS}=10V, V_{GS}=10V, I_D=15A		1.5		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=10V, V_{GS}=10V, I_D=15A		1.0		nC
Diode Forward Voltage	V_{SD}	I_S=15A, V_{GS}=0		1.0	1.2	V

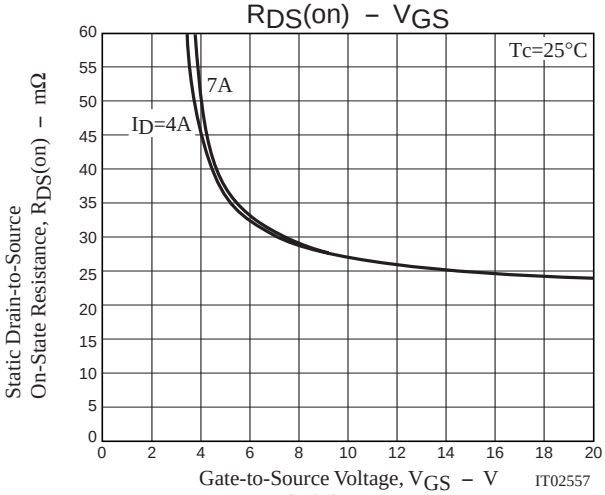
Marking : K3278

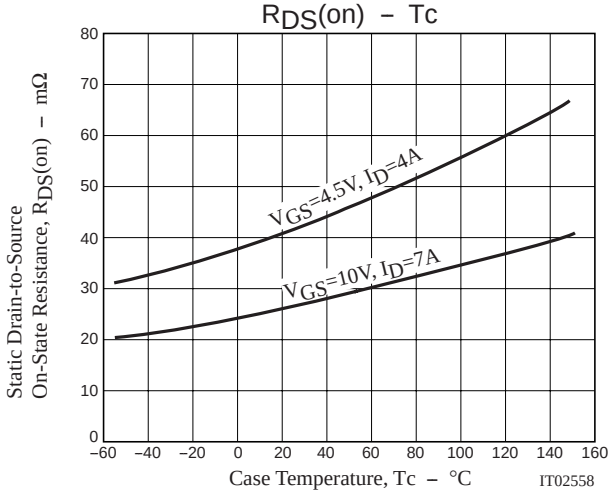
Switching Time Test Circuit

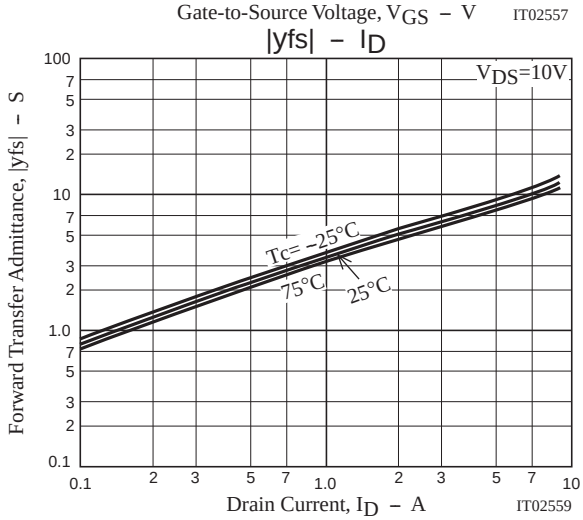


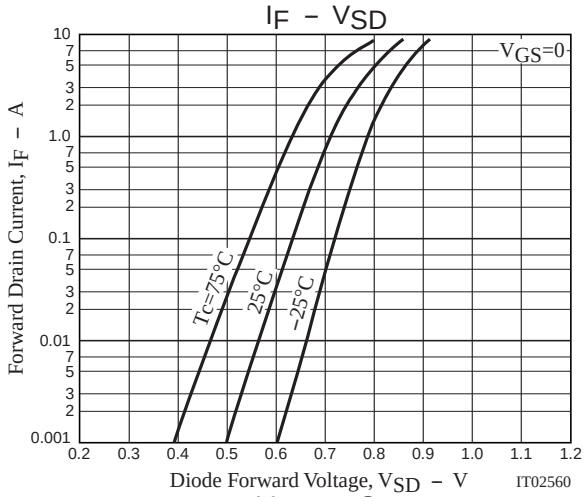


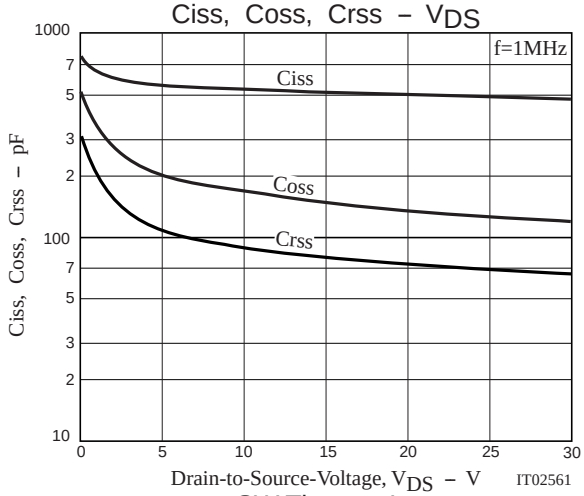


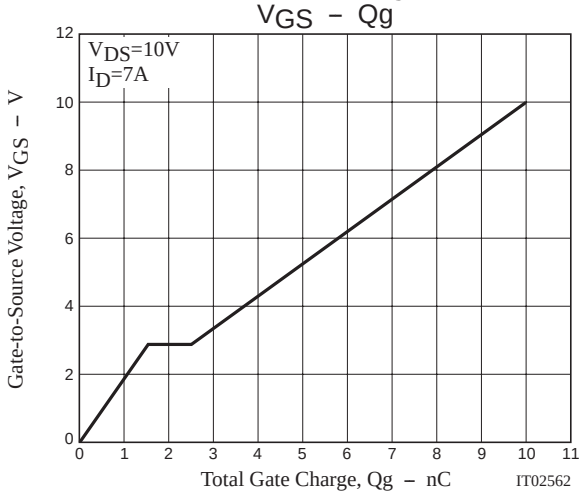

RDS(on) – VGS
Tc=25°C
7A
ID=4A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT02557

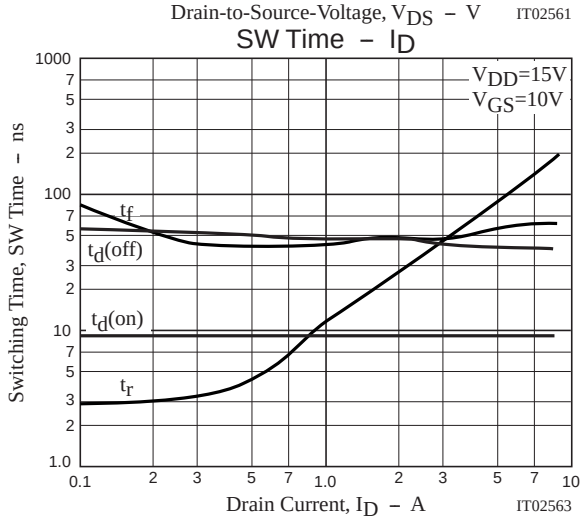

RDS(on) – Tc
VGS=4.5V, ID=4A
VGS=10V, ID=7A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Case Temperature, Tc – °C
IT02558

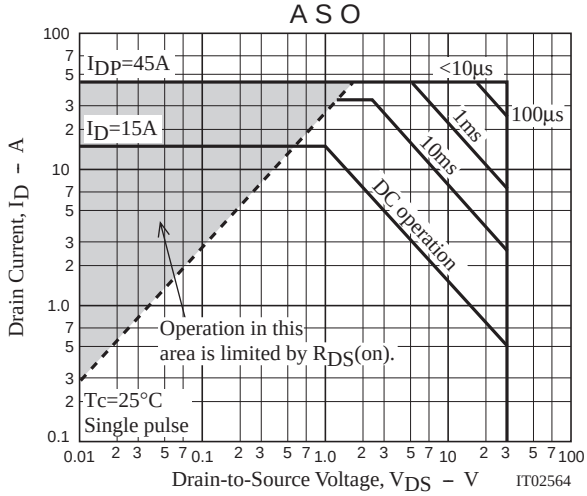

|yfs| – ID
VDS=10V
Tc=–25°C
75°C
25°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT02559


IF – VSD
VGS=0
Tc=75°C
25°C
–25°C
Forward Drain Current, IF – A
Diode Forward Voltage, VSD – V
IT02560


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source-Voltage, VDS – V
IT02561


VGS – Qg
VDS=10V
ID=7A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT02562


SW Time – ID
VDD=15V
VGS=10V
tf
td(off)
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT02563


A S O
IDP=45A
ID=15A
<10μs
100μs
1ms
10ms
DC operation
Operation in this area is limited by RDS(on).
Tc=25°C
Single pulse
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT02564