Ordering number : ENN7153

N-Channel Silicon MOSFET

2SK3415LS

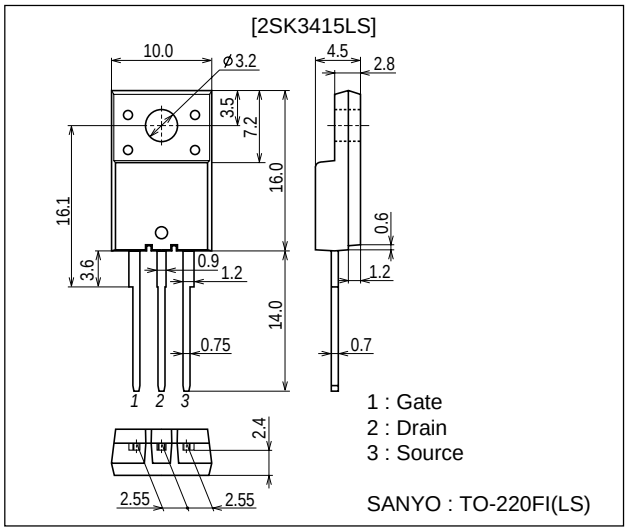
DC / DC Converter, Motor Driver Applications

Features

- Low ON-resistance.
- 4V drive.

Package Dimensions

unit : mm
2078C



Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		60	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		40	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	160	A
Allowable Power Dissipation	P_D		2.0	W
		Tc=25°C	35	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		-55 to +150	°C

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
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}=±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=20A	30	42		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=20A, V_{GS}=10V		13	17	mΩ
	R_{DS}(on)2	I_D=20A, V_{GS}=4V		17	24	mΩ

Continued on next page.

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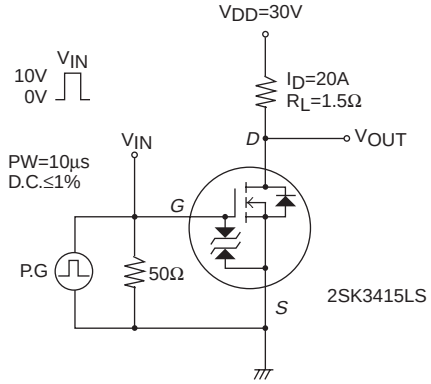
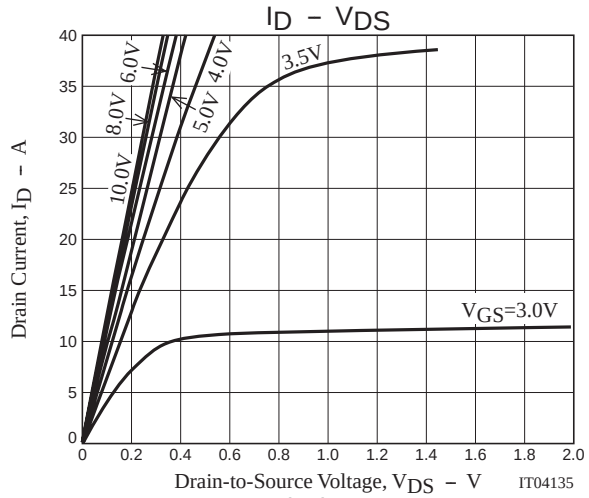
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

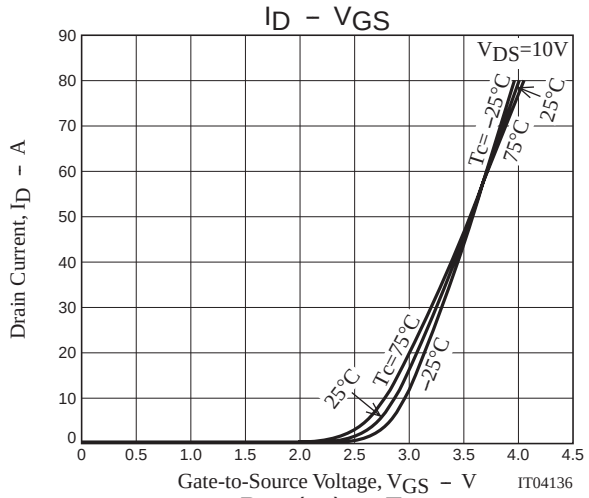
Continued from preceding page.

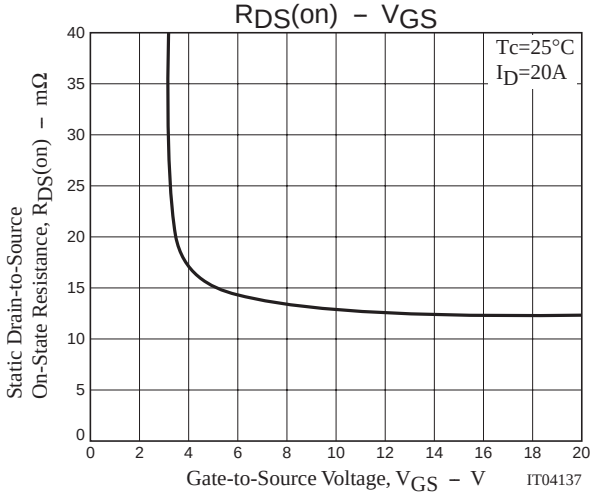
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		3000		pF
Output Capacitance	Coss	V_{DS}=20V, f=1MHz		600		pF
Reverse Transfer Capacitance	Crss	V_{DS}=20V, f=1MHz		180		pF
Turn-ON Delay Time	t_{d}(on)	I_D=18A, V_{GS}=10V, V_{DD}=30V, R_{GS}=50Ω		23		ns
Rise Time	t_r	I_D=18A, V_{GS}=10V, V_{DD}=30V, R_{GS}=50Ω		140		ns
Turn-OFF Delay Time	t_{d}(off)	I_D=18A, V_{GS}=10V, V_{DD}=30V, R_{GS}=50Ω		290		ns
Fall Time	t_f	I_D=18A, V_{GS}=10V, V_{DD}=30V, R_{GS}=50Ω		120		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=10V, I_D=40A		89		nC
Gate-to-Source Charge	Qgs	V_{DS}=10V, V_{GS}=10V, I_D=40A		10		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=10V, V_{GS}=10V, I_D=40A		22		nC
Diode Forward Voltage	V_{SD}	I_S=40A, V_{GS}=0		0.9	1.2	V

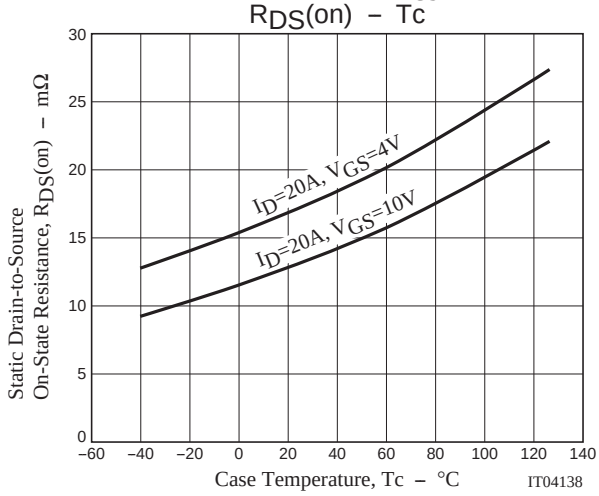
Switching Time Test Circuit

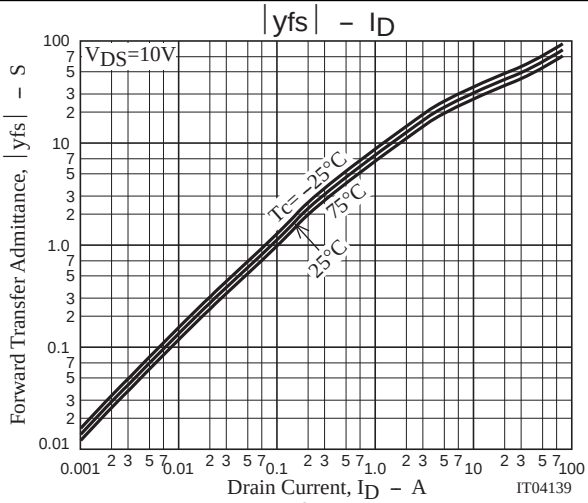


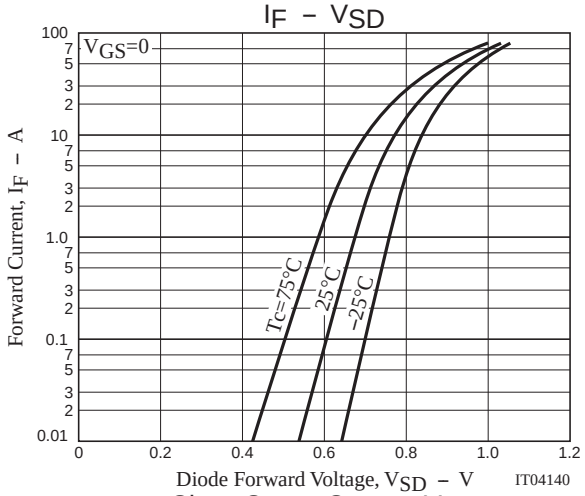


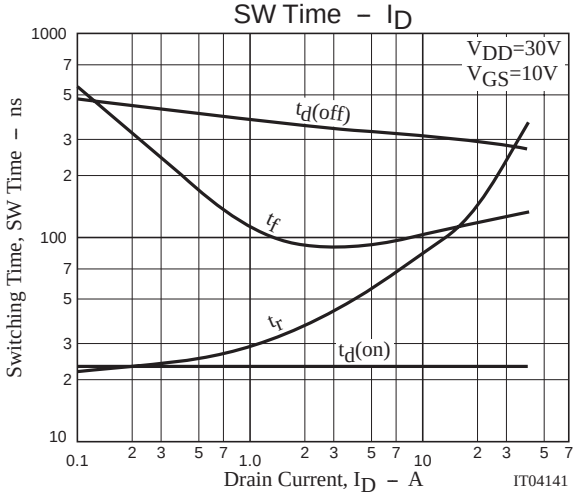


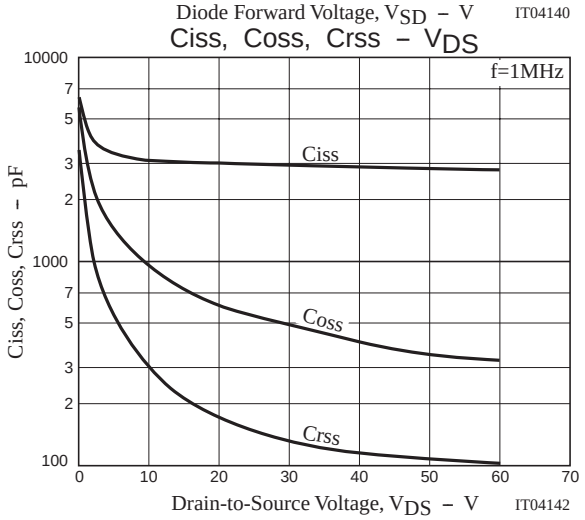


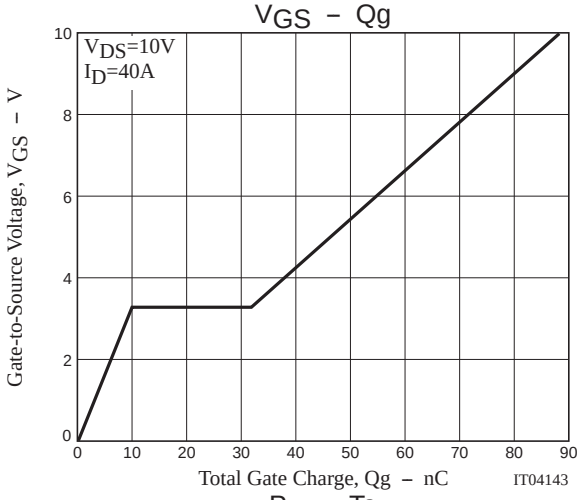


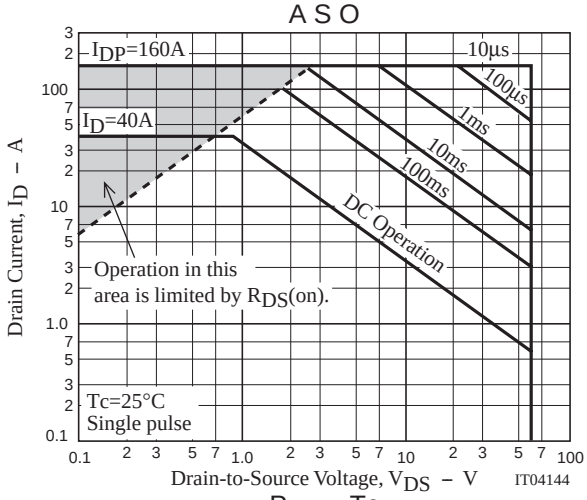

|yfs| – ID
VDS=10V
Tc=–25°C
75°C
25°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT04139

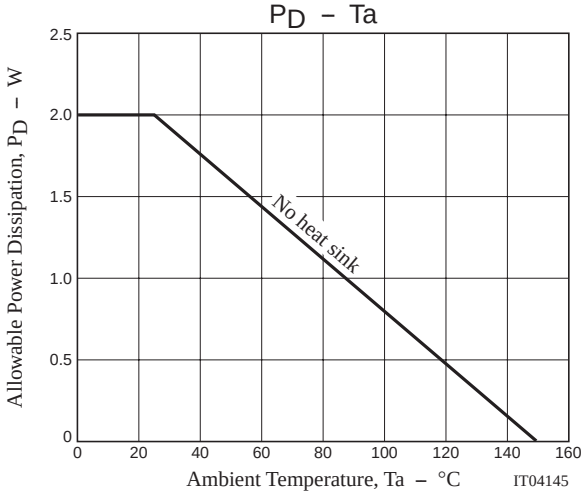

IF – VSD
VGS=0
Tc=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT04140

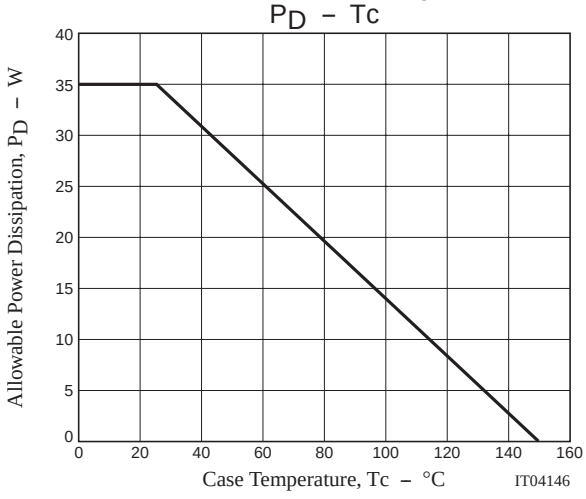

SW Time – ID
VDD=30V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT04141


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT04142


VGS – Qg
VDS=10V
ID=40A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT04143


A S O
IDP=160A
ID=40A
10μs
100μs
1ms
10ms
100ms
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
IT04144


PD – Ta
No heat sink
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT04145


PD – Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
IT04146