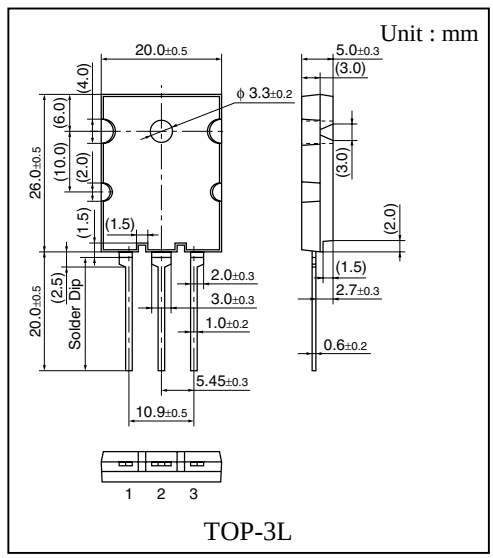
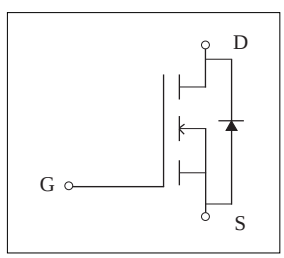
Silicon MOSFET

2SK3665

N-channel enhancement mode MOSFET

High speed switching





■ Absolute Maximum Ratings

Parameter		Symbol	Rating	Unit
Drain-Source breakdown voltage		V_{DSS}	200	V
Gate-Source voltage		V_{GSS}	±30	V
Drain current	DC	I_D	30	A
	Pulse	I_{DP}	120	A
Avalanche energy capability *1		EAS	1800	m J
Allowable power dissipation	Tc = 25 °C *2	P_D	180	W
	Ta = 25 °C *3	P_D	3	W
Junction temperature		T_j	150	°C
Storage temperature		T_{stg}	-55 to +150	°C

*1 : Guarantee of single pulse avalanche energy.
(L = 2mH, I_L = 30A, V_{DD} = 100V, 1pulse, Ta = 25 °C)
*2 : Tc = 25 °C
*3 : Ta = 25 °C (Without heat sink)

■ Electrical Characteristics (Tc = 25 ± 3 °C)

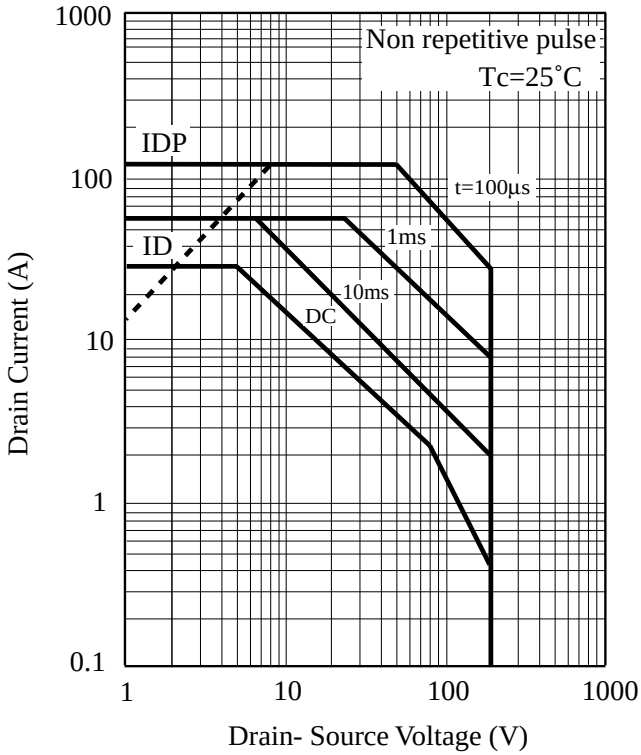
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain Cutoff Current	I_{DSS}	V_{DS} = 160V, V_{GS} = 0	–	–	100	μ A
Gate-source Leakage Current	I_{GSS}	V_{GS} = ± 30 V, V_{DS} = 0	–	–	± 1	μ A
Drain-source Breakdown Voltage	V_{DSS}	I_D = 1 mA, V_{GS} = 0	200	–	–	V
Gate Threshold Voltage	Vth	V_{DS} = 10 V, I_D = 1 mA	1.5	–	3.5	V
Drain-source on Resistance	$R_{DS\ (on)}$	V_{GS} = 10 V, I_D = 15 A	–	50	68	m Ω
Forward Transfer Admittance	|Yfs|	V_{DS} = 25 V, I_D = 15 A	8	16	–	S
Input Capacitance	Ciss	V_{DS} = 25 V, V_{GS} = 0, f = 1MHz	–	3170	–	p F
Output Capacitance	Coss		–	440	–	p F
Reverse Transfer Capacitance	Crss		–	35	–	p F
Turn-on delay time	td (on)	V_{DD} = 100V, I_D = 15 A, R_L = 6.7 Ω, V_{GS} = 10 V	–	36	–	n s
Rise time	tr		–	42	–	n s
Turn-off delay time	td (off)		–	230	–	n s
Fall time	tf		–	50	–	n s

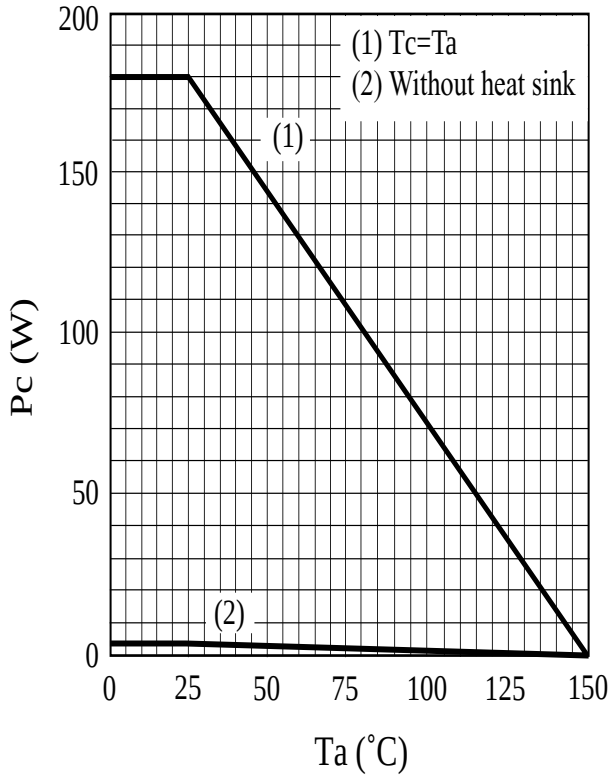
■ Electrical Characteristics (Tc = 25 ± 3 °C)

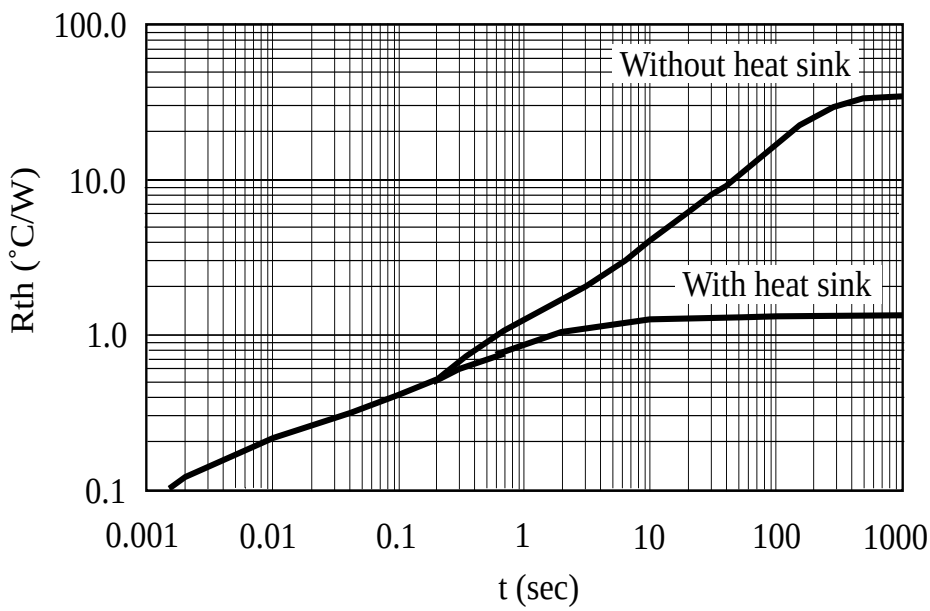
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Diode forward Voltage	V_{DSF}	I_{DR} = 30V, V_{GS} = 0	–	–	-1.5	V
Reverse recovery Time	T_{rr}	L = 230 μH, V_{DD} = 100V	–	182	–	n s
Reverse recovery Charge	Q_{rr}	I_{DR} = 15 A, di/dt = 100A/μs	–	819	–	n C
Total Gate Charge	Q_g	V_{DD} = 100 V, I_D = 25 A	–	55	–	n C
Gate-Source Charge	Q_{gs}	V_{GS} = 10 V	–	10	–	n C
Gate-Drain Charge	Q_{gd}		–	16	–	n C

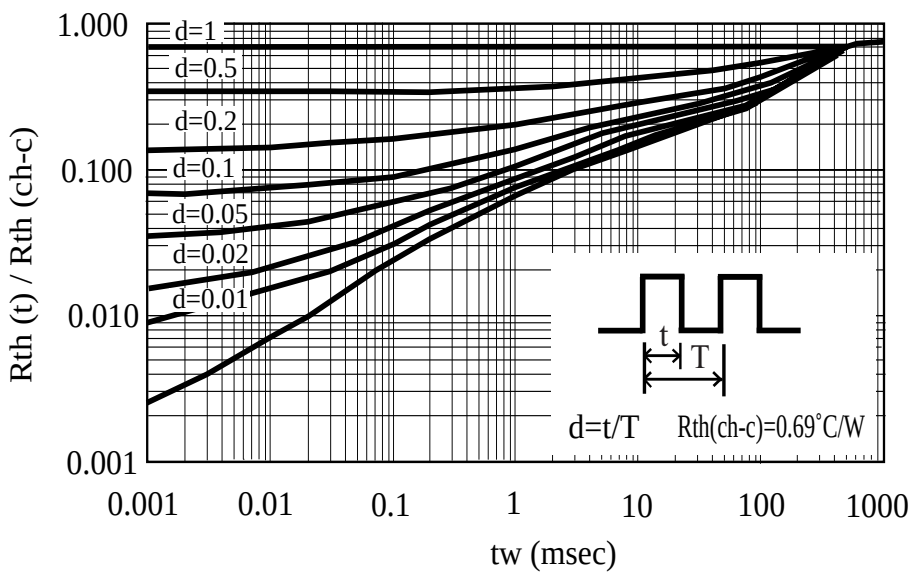
■ Thermal characteristics

Thermal resistance (channel to case)	$R_{th\ (ch-c)}$		–	–	0.69	°C/W
Thermal resistance (channel to ambient)	$R_{th\ (ch-a)}$		–	–	41.6	°C/W


Non repetitive pulse
Tc=25˚C
IDP
ID
t=100µs
1ms
10ms
DC
Drain Current (A)
Drain- Source Voltage (V)
1000
100
10
1
0.1
1
10
100
1000


(1) Tc=Ta
(2) Without heat sink
(1)
(2)
Pc (W)
Ta (˚C)
200
150
100
50
0
0
25
50
75
100
125
150


Without heat sink
With heat sink
Rth (˚C/W)
t (sec)
100.0
10.0
1.0
0.1
0.001
0.01
0.1
1
10
100
1000


d=1
d=0.5
d=0.2
d=0.1
d=0.05
d=0.02
d=0.01
t
T
d=t/T
Rth(ch-c)=0.69˚C/W
Rth (t) / Rth (ch-c)
tw (msec)
1.000
0.100
0.010
0.001
0.001
0.01
0.1
1
10
100
1000

Derating curve for safety operation