

**100 V, 47 A, 13.2 mΩ Low R_{DS(ON)}
N ch Trench Power MOSFET
EKI10198**

Sanken

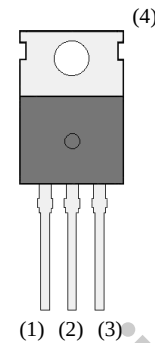
Data Sheet

Features

- V_{(BR)DSS} -----100 V (I_D = 100 μA)
- I_D -----47 A
- R_{DS(ON)} ----- 18.4 mΩ max. (V_{GS} = 10 V, I_D = 23.4 A)
- Q_g-----27.1 nC (V_{GS} = 4.5 V, V_{DS} = 50 V, I_D = 23.4 A)
- Low Total Gate Charge
- High Speed Switching
- Low On-Resistance
- Capable of 4.5 V Gate Drive
- 100 % UIL Tested
- RoHS Compliant

Package

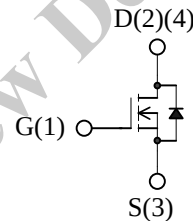
- TO220-3L



Not to scale

Applications

- DC-DC converters
- Synchronous Rectification
- Power Supplies



Absolute Maximum Ratings

- Unless otherwise specified, T_A = 25 °C

Parameter	Symbol	Test conditions	Rating	Unit
Drain to Source Voltage	V _{DS}		100	V
Gate to Source Voltage	V _{GS}		± 20	V
Continuous Drain Current	I _D	T _C = 25 °C	47	A
Pulsed Drain Current	I _{DM}	PW ≤ 100μs Duty cycle ≤ 1 %	94	A
Continuous Source Current (Body Diode)	I _S		47	A
Pulsed Source Current (Body Diode)	I _{SM}	PW ≤ 100μs Duty cycle ≤ 1 %	94	A
Single Pulse Avalanche Energy	E _{AS}	V _{DD} = 50 V, L = 1 mH, I _{AS} = 11.2 A, unclamped, R _G = 4.7 Ω Refer to Figure 1	126	mJ
Avalanche Current	I _{AS}		23.3	A
Power Dissipation	P _D	T _C = 25 °C	116	W
Operating Junction Temperature	T _J		150	°C
Storage Temperature Range	T _{STG}		– 55 to 150	°C

Thermal Characteristics

- Unless otherwise specified, $T_A = 25\text{ }^{\circ}\text{C}$

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Thermal Resistance (Junction to Case)	$R_{\theta JC}$		—	—	1.1	$^{\circ}\text{C}/\text{W}$
Thermal Resistance (Junction to Ambient)	$R_{\theta JA}$		—	—	62.5	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics

- Unless otherwise specified, $T_A = 25\text{ }^{\circ}\text{C}$

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 100\text{ }\mu\text{A}$, $V_{GS} = 0\text{ V}$	100	—	—	V
Drain to Source Leakage Current	I_{DSS}	$V_{DS} = 100\text{ V}$, $V_{GS} = 0\text{ V}$	—	—	100	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS} = \pm 20\text{ V}$	—	—	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 1\text{ mA}$	1.0	2.0	2.5	V
Static Drain to Source On-Resistance	$R_{DS(on)}$	$I_D = 23.4\text{ A}$, $V_{GS} = 10\text{ V}$	—	13.2	18.4	m Ω
		$I_D = 11.7\text{ A}$, $V_{GS} = 4.5\text{ V}$	—	14.0	19.3	m Ω
Gate Resistance	R_G	$f = 1\text{ MHz}$	—	1.1	—	Ω
Input Capacitance	C_{iss}	$V_{DS} = 25\text{ V}$ $V_{GS} = 0\text{ V}$ $f = 1\text{ MHz}$	—	3990	—	pF
Output Capacitance	C_{oss}		—	300	—	
Reverse Transfer Capacitance	C_{rss}		—	160	—	
Total Gate Charge ($V_{GS} = 10\text{ V}$)	Q_{g1}	$V_{DS} = 50\text{ V}$ $I_D = 23.4\text{ A}$	—	57.7	—	nC
Total Gate Charge ($V_{GS} = 4.5\text{ V}$)	Q_{g2}		—	27.1	—	
Gate to Source Charge	Q_{gs}		—	10.1	—	
Gate to Drain Charge	Q_{gd}		—	7.5	—	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 50\text{ V}$ $I_D = 23.4\text{ A}$ $V_{GS} = 10\text{ V}$, $R_G = 4.7\text{ }\Omega$ Refer to Figure 2	—	7.0	—	ns
Rise Time	t_r		—	6.5	—	
Turn-Off Delay Time	$t_{d(off)}$		—	34.2	—	
Fall Time	t_f		—	13.9	—	
Source to Drain Diode Forward Voltage	V_{SD}	$I_S = 23.4\text{ A}$, $V_{GS} = 0\text{ V}$	—	0.9	1.5	V
Source to Drain Diode Reverse Recovery Time	t_{rr}	$I_F = 23.4\text{ A}$ $di/dt = 100\text{ A}/\mu\text{s}$ Refer to Figure 3	—	49.2	—	ns
Source to Drain Diode Reverse Recovery Charge	Q_{rr}		—	92.7	—	nC

Test Circuits and Performance Curves

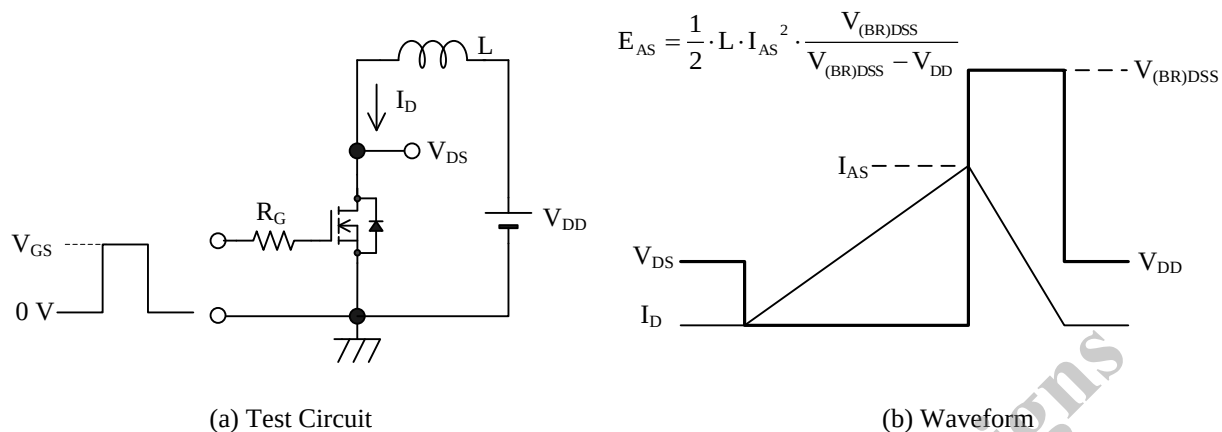


Figure 1. Unclamped Inductive Switching

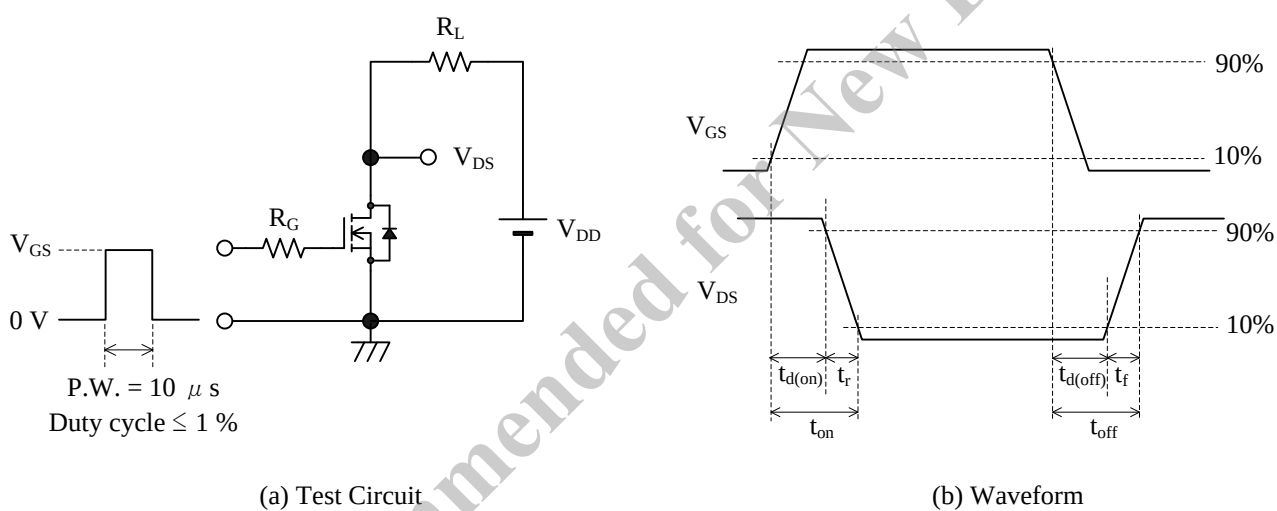


Figure 2. Switching Time

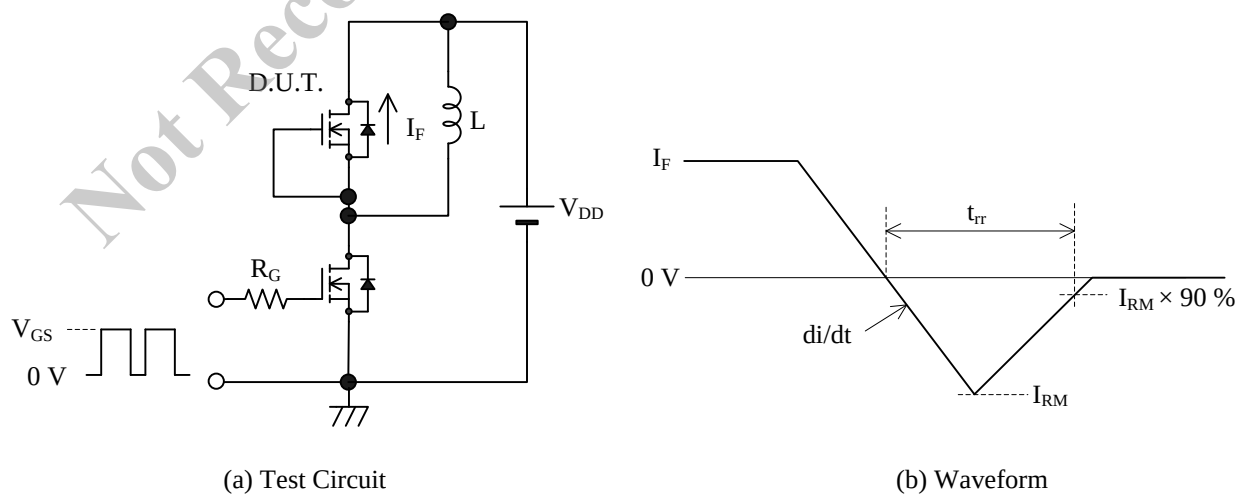
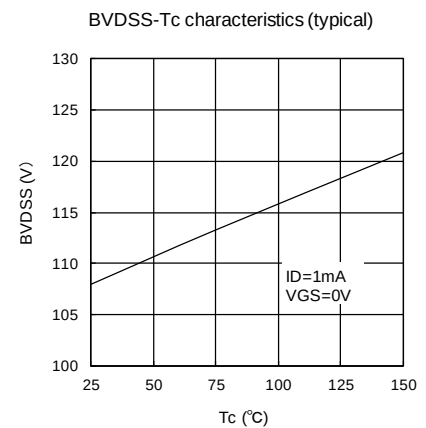
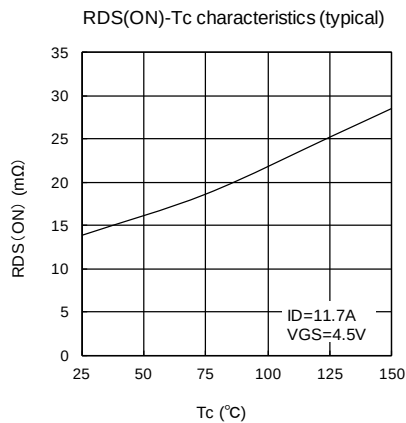
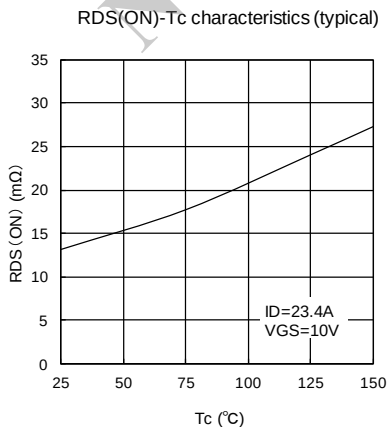
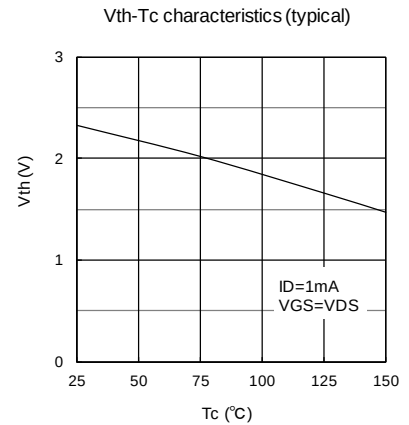
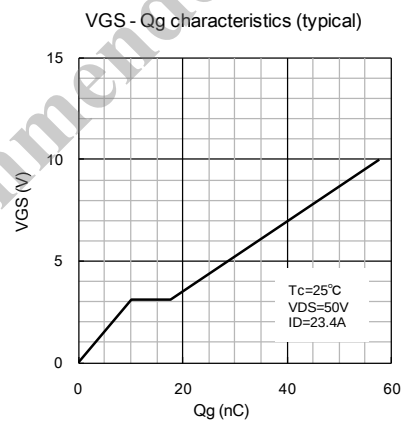
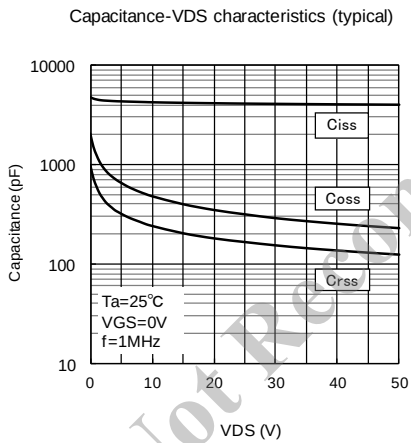
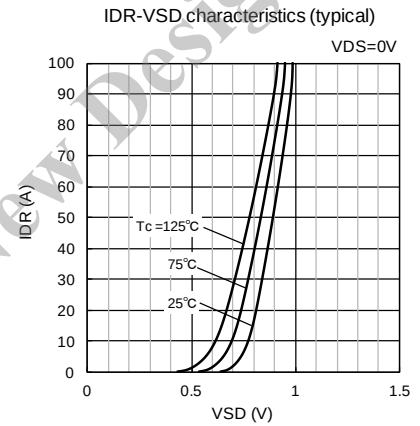
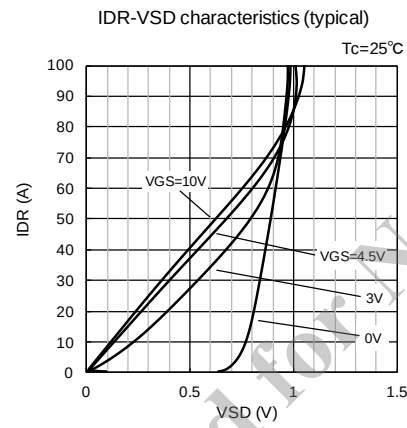
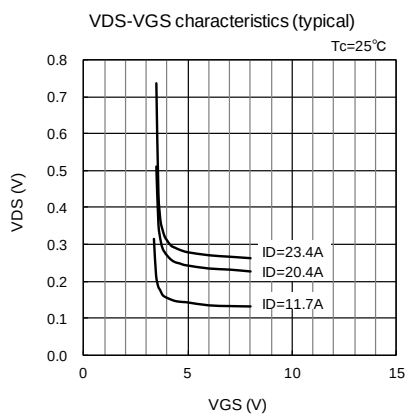
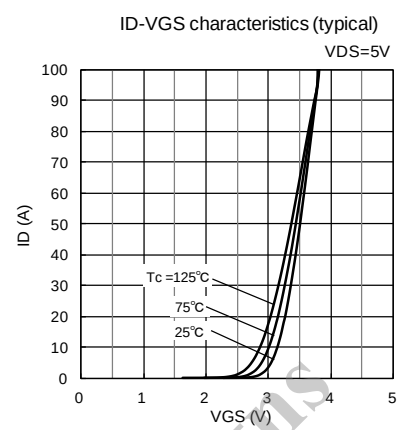
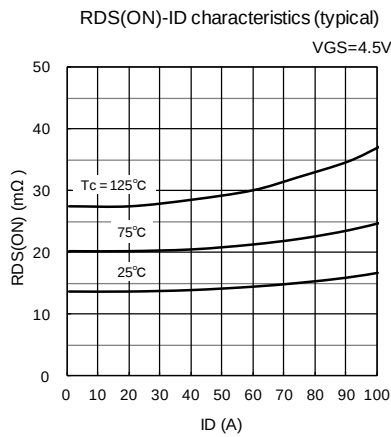
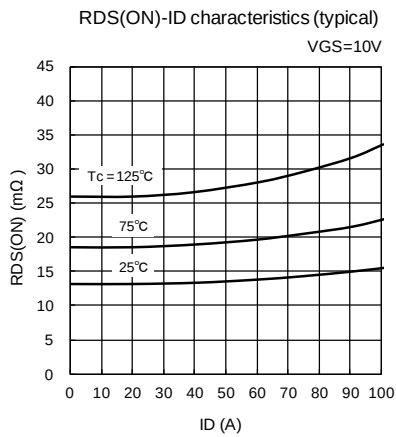
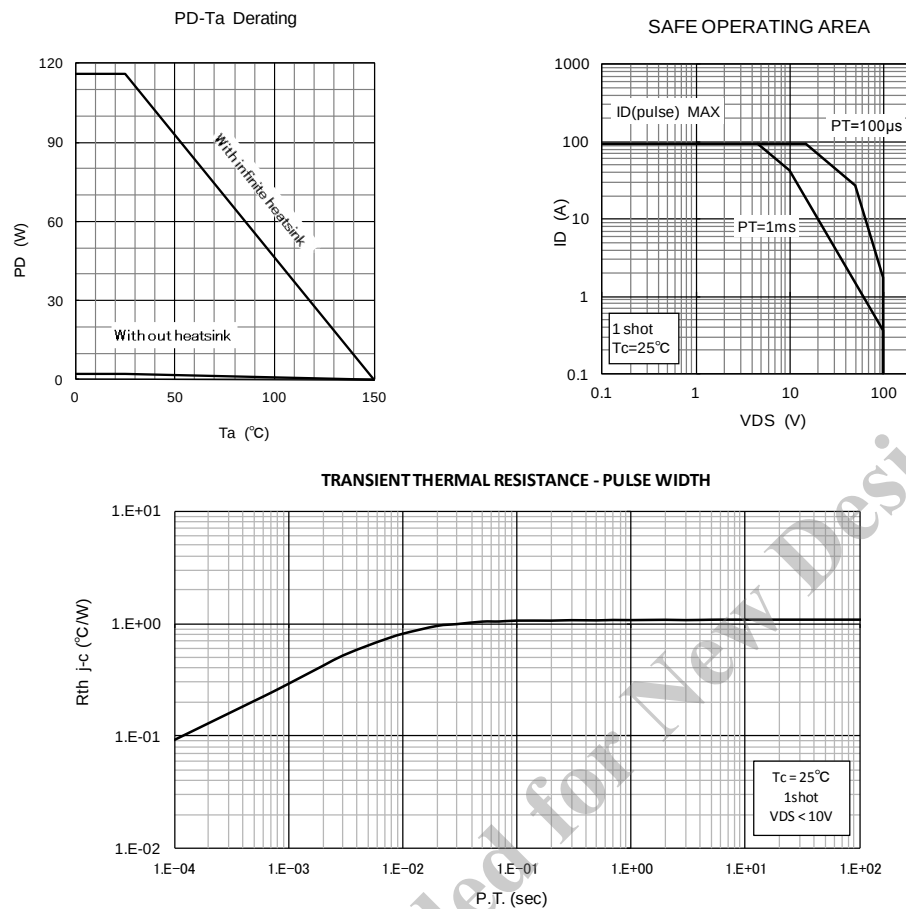


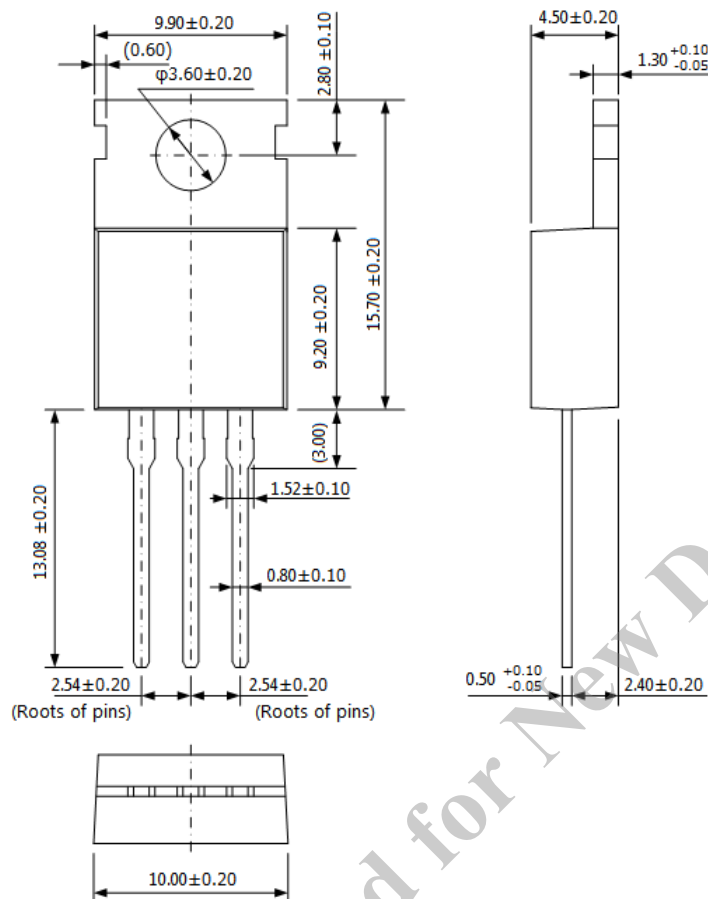
Figure 3. Diode Reverse Recovery Time



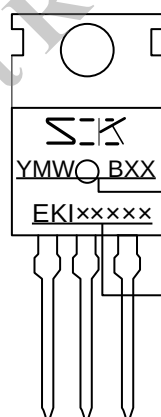


Physical Dimensions

- TO220-3L

**NOTES:**

- Dimensions in millimeters
- Maximum gate burr height is 0.3 mm.
- Bare lead frame: Pb-free (RoHS compliant)
- When soldering the products, it is required to minimize the working time, within the following limits:
 Flow: 260 ± 5 °C / 10 ± 1 s, 2 times
 Soldering Iron: 380 ± 10 °C / 3.5 ± 0.5 s, 1 time
 Soldering should be at a distance of at least 1.5 mm from the body of the product.
- Recommended screw torque for TO220: 0.490 N·m to 0.686 N·m (5 kgf·cm to 7 kgf·cm)

Marking Diagram

Lot Number:

Y is the last digit of the year of manufacture (0 to 9)
 M is the month of the year (1 to 9, O, N, or D)
 W is the week of the month (1 to 5)
 B expresses Pb free pins
 XX is the control number

Part Number

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