

## 2SK2096

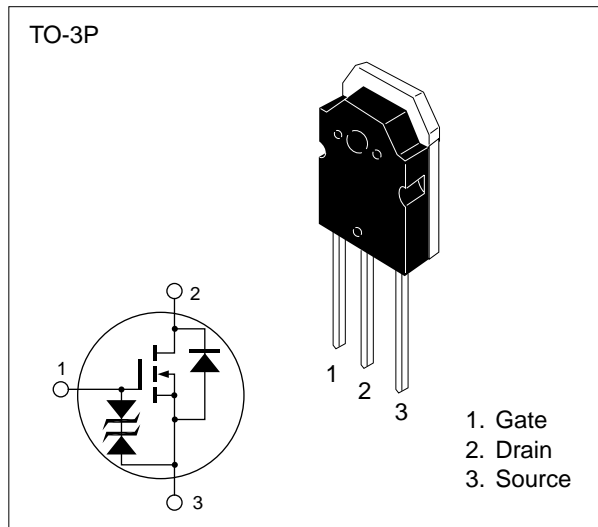
### Silicon N Channel MOS FET

#### Application

High speed power switching

#### Features

- Low on-resistance
- High speed switching
- Low drive current
- 4 V gate drive device can be driven from 5 V source
- Suitable for switching regulator, DC-DC converter
- Avalanche ratings



**Table 1 Absolute Maximum Ratings** (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V <sub>DSS</sub>	60	V
Gate to source voltage	V <sub>GSS</sub>	±20	V
Drain current	I <sub>D</sub>	45	A
Drain peak current	I <sub>D(pulse)</sub> *	180	A
Body-drain diode reverse drain current	I <sub>DR</sub>	45	A
Avalanche current	I <sub>AP</sub> ***	45	A
Avalanche energy	E <sub>AR</sub> ***	173	mJ
Channel dissipation	P <sub>ch</sub> **	100	W
Channel temperature	T <sub>ch</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

\* PW ≤ 10 μs, duty cycle ≤ 1 %

\*\* Value at T<sub>c</sub> = 25 °C

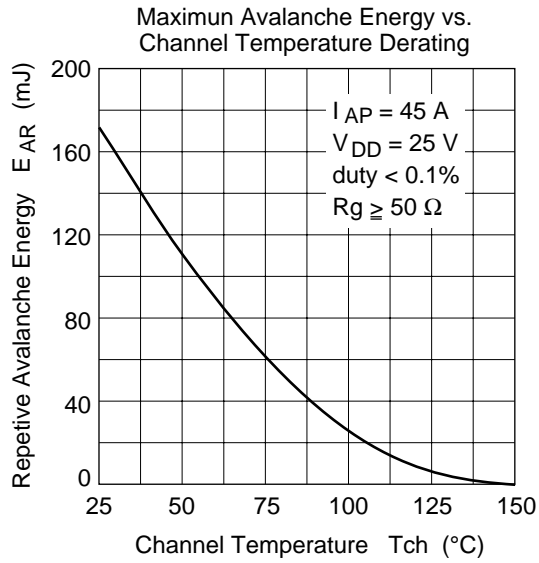
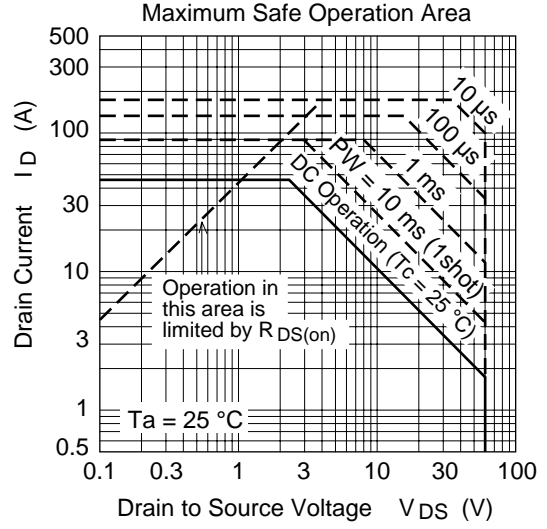
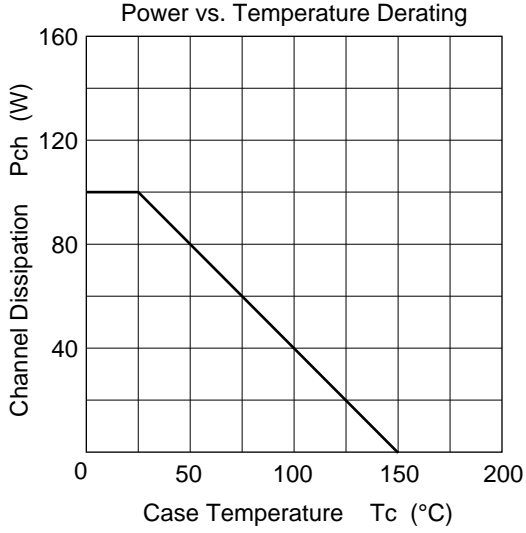
\*\*\* Value at T<sub>ch</sub> = 25 °C, R<sub>g</sub> ≥ 50 Ω

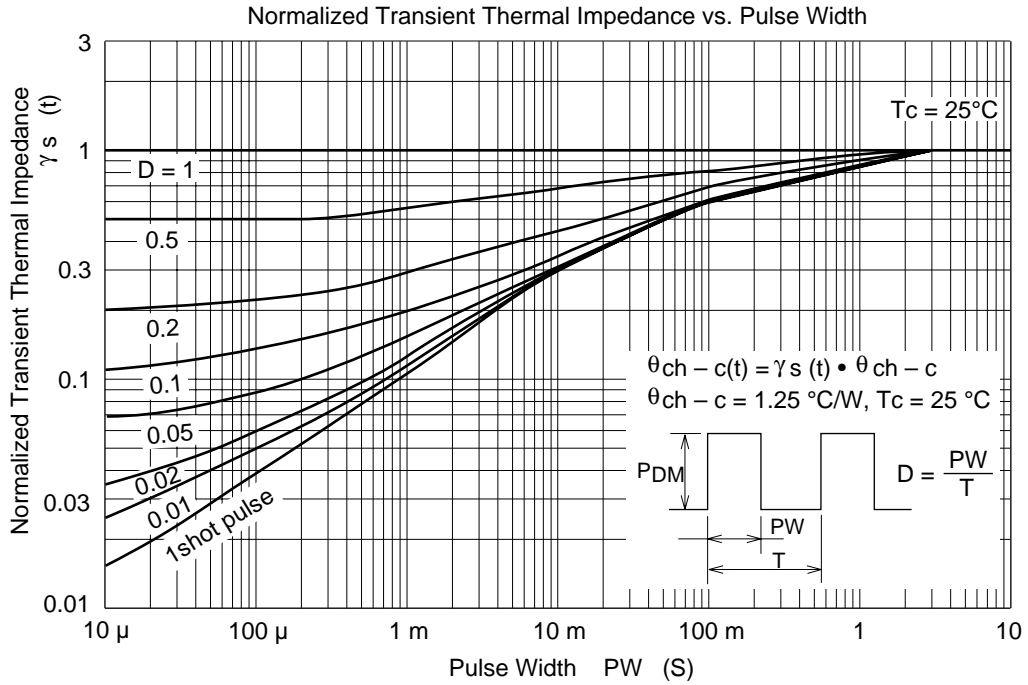
**Table 2 Electrical Characteristics** (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	$I_G = \pm 100 \text{ } \mu\text{A}, V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	±10	μA	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	250	μA	$V_{DS} = 50 \text{ V}, V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.25	V	$I_D = 1 \text{ mA}, V_{DS} = 10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.018	0.022	Ω	$I_D = 25 \text{ A}$ $V_{GS} = 10 \text{ V}^*$
		—	0.023	0.028	Ω	$I_D = 25 \text{ A}$ $V_{GS} = 4 \text{ V}^*$
Forward transfer admittance	$ y_{fs} $	25	37	—	S	$I_D = 25 \text{ A}$ $V_{DS} = 10 \text{ V}^*$
Input capacitance	$C_{iss}$	—	3530	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	$C_{oss}$	—	1480	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	300	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	33	—	ns	$I_D = 25 \text{ A}$
Rise time	$t_r$	—	160	—	ns	$V_{GS} = 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	450	—	ns	$R_L = 1.5 \text{ } \Omega$
Fall time	$t_f$	—	230	—	ns	
Body-drain diode forward voltage	$V_{DF}$	—	1.3	—	V	$I_F = 45 \text{ A}, V_{GS} = 0$
Body-drain diode reverse recovery time	$t_{rr}$	—	130	—	ns	$I_F = 45 \text{ A}, V_{GS} = 0,$ $di_F / dt = 50 \text{ A} / \mu\text{s}$

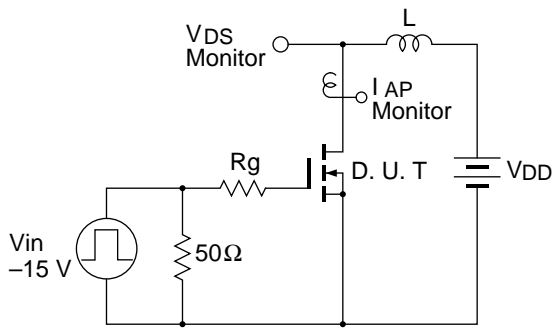
\* Pulse Test

■ See characteristic curve of 2SK1911.





### Avalanche Test Circuit and Waveform



$$E_{AR} = \frac{1}{2} \cdot L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$

