

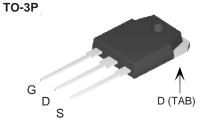
2SK3129_06-VB Datasheet N-Channel 60 V (D-S) 175 °C MOSFET

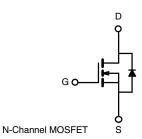
PRODUCT SUMMARY				
V _{DS} (V)	60			
$R_{DS(on)} (\Omega)$ at $V_{GS} = 10 V$	0.005			
I _D (A)	150			
Configuration	Single			
Package	TO-247			

FEATURES

- Trench power MOSFET
- Package with low thermal resistance
- 100 % R_g and UIS tested







ABSOLUTE MAXIMUM RATINGS ($T_C = 25 \text{ °C}$, unless otherwise noted)					
PARAMETER		SYMBOL	LIMIT	UNIT	
Drain-Source Voltage		V _{DS}	60	V	
Gate-Source Voltage		V _{GS}	± 20	v	
Continuous Drain Current	T _C = 25 °C	- I _D	150		
	T _C = 125 °C		88		
Continuous Source Current (Diode Conduction) ^a		I _S	120	А	
Pulsed Drain Current ^b		I _{DM}	480		
Single Pulse Avalanche Current	L = 0.1 mH	I _{AS}	65		
Single Pulse Avalanche Energy	L = 0.1 mm	E _{AS}	211	mJ	
Maximum Power Dissipation ^b	T _C = 25 °C	- P _D	175	W	
	T _C = 125 °C		56	٧V	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55 to +175	°C	

THERMAL RESISTANCE RATINGS					
PARAMETER		SYMBOL	LIMIT	UNIT	
Junction-to-Ambient	PCB Mount ^c R _{thJA} 40		40	°C/W	
Junction-to-Case (Drain)		R _{thJC}	0.88	0/10	

Notes

- a. Package limited.
- b. Pulse test; pulse width $\leq 300~\mu s,$ duty cycle $\leq 2~\%.$
- c. When mounted on 1" square PCB (FR4 material).
- d. Parametric verification ongoing.

PARAMETER Static Drain-Source Breakdown Voltage Gate-Source Threshold Voltage Gate-Source Leakage Zero Gate Voltage Drain Current	SYMBOL V _{DS} V _{GS(th)} I _{GSS}	V _{GS}	T CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain-Source Breakdown Voltage Gate-Source Threshold Voltage Gate-Source Leakage	V _{GS(th)}						
Gate-Source Threshold Voltage Gate-Source Leakage	V _{GS(th)}		$-0 l_{\rm p} - 250 \mu \Delta$	60	-	_	1
Gate-Source Leakage			$V_{GS} = 0, I_D = 250 \mu A$		3.0	3.5	V
5	IGSS	$V_{DS} = V_{GS}$, $I_D = 250 \mu A$		2.5			
Zero Gate Voltage Drain Current		$V_{DS} = 0 V, V_{GS} = \pm 20 V$		-	-	± 100	nA
Zero Gate Voltage Drain Current		$V_{GS} = 0 V$	$V_{DS} = 60 V$	-	-	1	4
	IDSS	$V_{GS} = 0 V$	V _{DS} = 60 V, T _J = 125 °C	-	-	50	μA
		$V_{GS} = 0 V$	V _{DS} = 60 V, T _J = 175 °C	-	-	250	
On-State Drain Current ^a	I _{D(on)}	$V_{GS} = 10 V$	$V_{DS} \ge 5 V$	120	-	-	A
		$V_{GS} = 10 V$	I _D = 30 A	-	0.005	-	Ω
Drain-Source On-State Resistance ^a	R _{DS(on)}	$V_{GS} = 10 V$	$I_D = 30 \text{ A}, \text{ T}_J = 125 \ ^\circ\text{C}$	-	0.0104	-	
		$V_{GS} = 10 V$	$I_D = 30 \text{ A}, \text{T}_\text{J} = 175 \ ^\circ\text{C}$	-	0.0129	-	
Forward Transconductance ^b	9 _{fs}	V _{DS} = 15 V, I _D = 30 A		-	94	-	S
Dynamic ^b							
Input Capacitance	C _{iss}			-	5196	6495	
Output Capacitance	C _{oss}	$V_{GS} = 0 V$	V _{DS} = 25 V, f = 1 MHz	-	708	885	рF
Reverse Transfer Capacitance	C _{rss}			-	336	420	1
Total Gate Charge ^c	Qg			-	96.5	145	
Gate-Source Charge ^c	Q _{qs}	V _{GS} = 10 V	V _{DS} = 30 V, I _D = 75 A	-	24.6	-	nC
Gate-Drain Charge ^c	Q _{gd}	-		-	27.2	-	1
Gate Resistance	R _q	f = 1 MHz		0.3	1	1.7	Ω
Turn-On Delay Time ^c	t _{d(on)}	$\begin{array}{l} V_{\text{DD}}=\text{30 V, }R_{\text{L}}=0.4\ \Omega\\ I_{\text{D}}\cong\text{75 A, }V_{\text{GEN}}=\text{10 V, }R_{\text{g}}=1\ \Omega \end{array}$		-	16	24	
Rise Time ^c	t _r			-	14	21	ns
Turn-Off Delay Time ^c	t _{d(off)}			-	34	51	
Fall Time °	t _f			-	9	14	
Source-Drain Diode Ratings and Chara		I		1			
Pulsed Current ^a	I _{SM}			-	-	480	А
Forward Voltage	V _{SD}	I :	= 75 A, V _{GS} = 0	-	0.9	1.5	V

Notes

a. Pulse test; pulse width \leq 300 µs, duty cycle \leq 2 %.

b. Guaranteed by design, not subject to production testing.

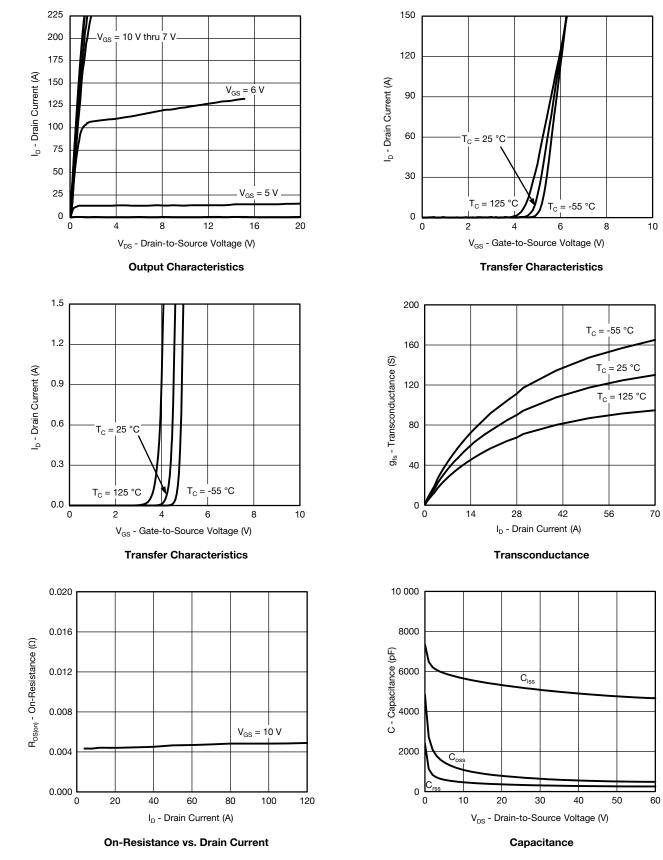
c. Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

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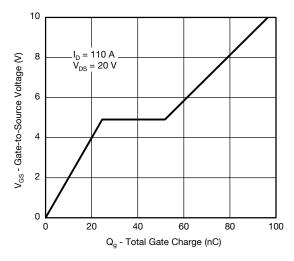


TYPICAL CHARACTERISTICS ($T_A = 25 \text{ °C}$, unless otherwise noted)

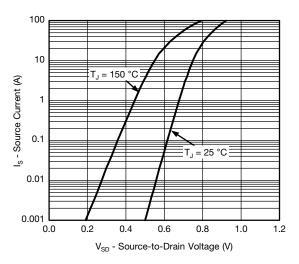




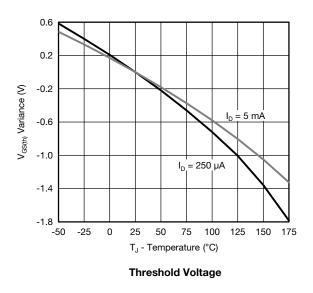
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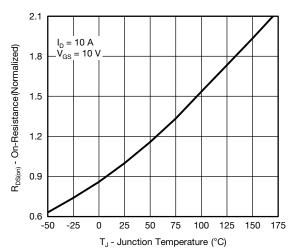


Gate Charge

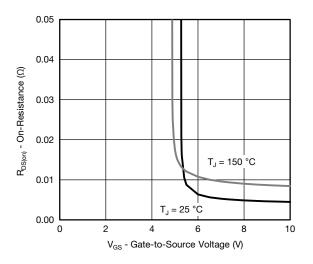


Source Drain Diode Forward Voltage

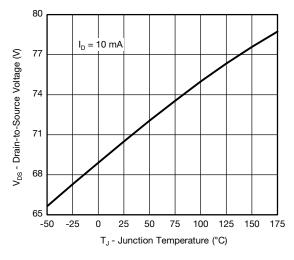


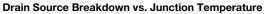


On-Resistance vs. Junction Temperature



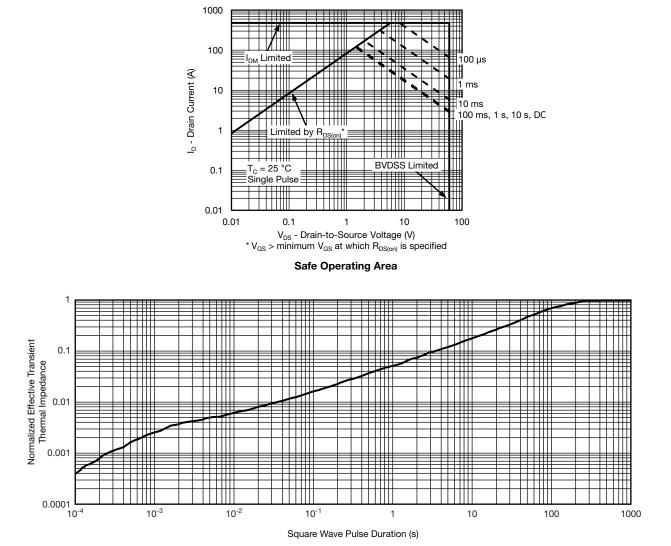
On-Resistance vs. Gate-to-Source Voltage







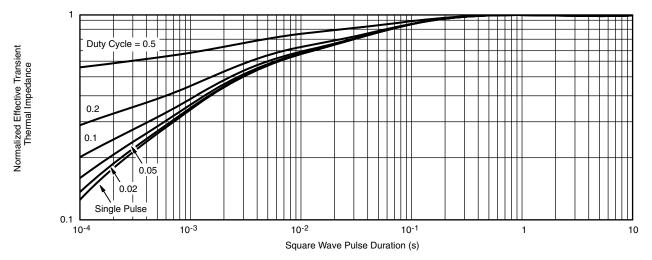
THERMAL RATINGS ($T_A = 25 \text{ °C}$, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



THERMAL RATINGS ($T_A = 25 \text{ °C}$, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Case

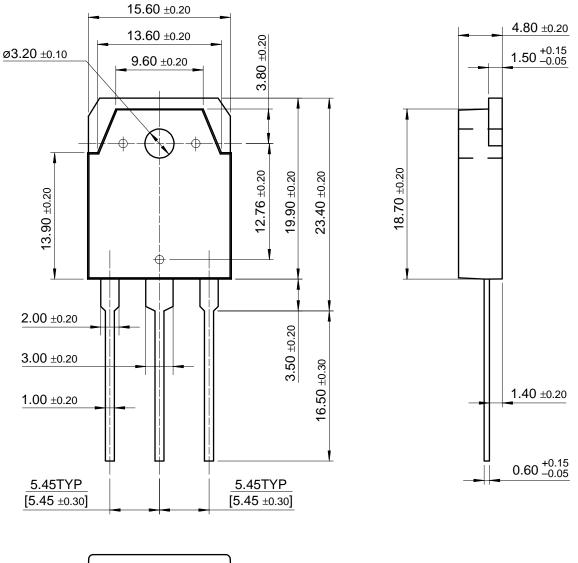
Note

- The characteristics shown in the two graphs
 - Normalized Transient Thermal Impedance Junction-to-Ambient (25 °C)
 - Normalized Transient Thermal Impedance Junction-to-Case (25 °C)

are given for general guidelines only to enable the user to get a "ball park" indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions.



TO-3P





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