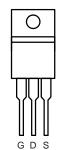


2SK2806-01-VB Datasheet N-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY	
V _{DS} (V)	30
$R_{DS(on)}$ (Ω) at V_{GS} = 10 V	0. 006
$R_{DS(on)}$ (Ω) at V_{GS} = 4.5 V	0. 009
I _D (A)	80
Configuration	Single
Package	TO-220AB

TO-220AB

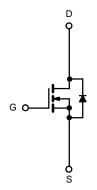


FEATURES

- Trench Power MOSFET
- 100 % R_g and UIS Tested



Compliant to RoHS Directive 2011/65/EU



N-Channel MOSFET

Parameter		Symbol	Limit	Unit	
Drain-Source Voltage		V _{DS}	30	Ň	
Gate-Source Voltage		V _{GS}	± 20	V	
Continuous Drain Current (T _J = 175 °C)	T _C = 25 °C		80	A	
	T _C = 70 °C		65		
	T _A = 25 °C	I _D	25.8 ^{b, c}		
	T _A = 70 °C		20 ^{b, c}	A	
Pulsed Drain Current		I _{DM}	200		
Avalanche Current Pulse	L = 0.1 mH	I _{AS}	39		
Single Pulse Avalanche Energy	L = 0.1 mm	E _{AS}	94.8	mJ	
Continuous Source-Drain Diode Current	T _C = 25 °C	I _S	50 ^{a, e}	٨	
Continuous Source-Drain Diode Current	T _A = 25 °C	IS	3.13 ^{b, c}	— A	
	T _C = 25 °C		120 ^a		
Maximum Power Dissipation	T _C = 70 °C	P	85		
	T _A = 25 °C	P _D	3.75 ^{b, c}		
	T _A = 70 °C		2.63 ^{b, c}		
Operating Junction and Storage Temperature Ra	ange	T _J , T _{stg}	- 55 to 175	°C	

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Тур.	Max.	Unit
Maximum Junction-to-Ambient ^{b, d}	$t \le 10 \text{ sec}$	R _{thJA}	32	40	°C/W
Maximum Junction-to-Case	Steady State	R _{thJC}	0.5	0.6	0/00

Notes: a. Based on T_C = 25 °C. b. Surface mounted on 1" x 1" FR4 board. c. t = 10 sec. d. Maximum under steady state conditions is 90 °C/W. e. Calculated based on maximum junction temperature. Package limitation current is 90 A.

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Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static					1	I	
Drain-Source Breakdown Voltage	V _{DS}	$V_{GS} = 0 V, I_{D} = 250 \mu A$	30			V	
V _{DS} Temperature Coefficient	$\Delta V_{DS}/T_{J}$	1 250 4		35			
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	I _D = 250 μA		- 7.5		mV/°C	
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = 250 \ \mu A$	1.0		2.5	V	
Gate-Source Leakage	I _{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA	
Zana Cata Maltana Duain Compant		$V_{DS} = 30 \text{ V}, \text{ V}_{GS} = 0 \text{ V}$			1		
Zero Gate Voltage Drain Current	IDSS	$V_{DS} = 30 \text{ V}, \text{ V}_{GS} = 0 \text{ V}, \text{ T}_{J} = 55 ^{\circ}\text{C}$			10	μA	
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \ge 5 \text{ V}, \text{ V}_{GS} = 10 \text{ V}$	90			A	
Drain-Source On-State Resistance ^a		V _{GS} = 10 V, I _D = 28.8 A		0.006			
	R _{DS(on)}	$V_{GS} = 4.5 \text{ V}, \text{ I}_{D} = 30 \text{ A}$		0.009		Ω	
Forward Transconductance ^a	9 _{fs}	V _{DS} = 15 V, I _D = 28.8 A		160		S	
Dynamic ^b				1	<u> </u>	1	
Input Capacitance	C _{iss}			1600			
Output Capacitance	C _{oss}	$V_{DS} = 15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		525		pF	
Reverse Transfer Capacitance	C _{rss}			370			
Tatal Oata Ohanna	0	V_{DS} = 15 V, V_{GS} = 10 V, I_{D} = 28.8 A		35	45	nC	
Total Gate Charge	Qg			25	35		
Gate-Source Charge	Q _{gs}	V_{DS} = 15 V, V_{GS} = 4.5 V, I_{D} = 28.8 A		15			
Gate-Drain Charge	Q _{gd}			20			
Gate Resistance	R _g	f = 1 MHz		1.4	2.1	Ω	
Turn-On Delay Time	t _{d(on)}			18	27		
Rise Time	t _r	V_{DD} = 15 V, R_L = 0.625 Ω		11	17		
Turn-Off Delay Time	t _{d(off)}	${\rm I}_{\rm D} \cong$ 24 A, ${\rm V}_{\rm GEN}$ = 10 V, ${\rm R}_{\rm g}$ = 1 Ω		70	105		
Fall Time	t _f			10	15		
Turn-On Delay Time	t _{d(on)}			55	83	- ns -	
Rise Time	t _r	V_{DD} = 15 V, R_L = 0.67 Ω		180	270		
Turn-Off Delay Time	t _{d(off)}	$\text{I}_\text{D}\cong$ 22.5 A, V_GEN = 4.5 V, R_g = 1 Ω		55	83		
Fall Time	t _f			12	18	1	
Drain-Source Body Diode Characteristic	cs						
Continuous Source-Drain Diode Current	۱ _S	$T_{C} = 25 \ ^{\circ}C$			120	^	
Pulse Diode Forward Current ^a	I _{SM}				120	A	
Body Diode Voltage	V _{SD}	I _S = 22 A		0.8	1.2	V	
Body Diode Reverse Recovery Time	t _{rr}			52	78	ns	
Body Diode Reverse Recovery Charge	Q _{rr}	$I_{-} = 20$ A di/dt = 100 A/ma T = 25 °C		70.2	105	nC	
Reverse Recovery Fall Time	t _a	I _F = 20 A, di/dt = 100 A/μs, T _J = 25 °C		27			
Reverse Recovery Rise Time	t _b			25		ns	

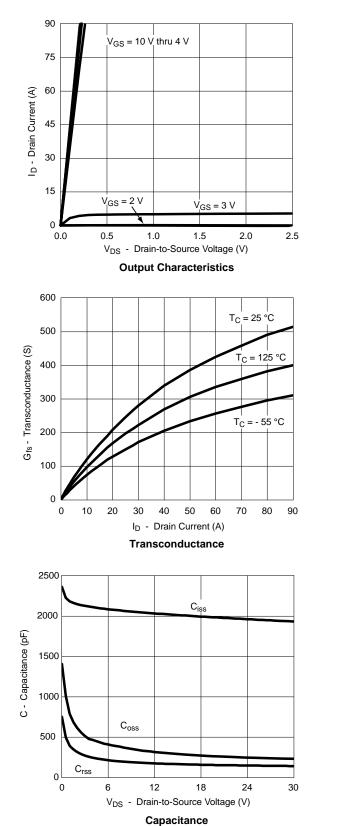
Notes:

a. Pulse test; pulse width \leq 300 $\mu s,$ duty cycle \leq 2 %.

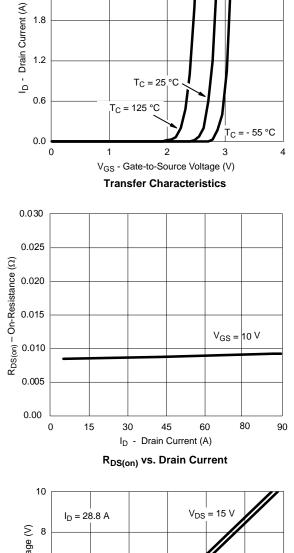
b. Guaranteed by design, not subject to production testing.

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.





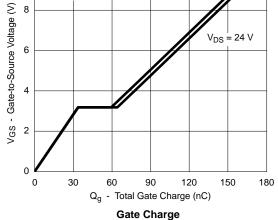
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



3.0

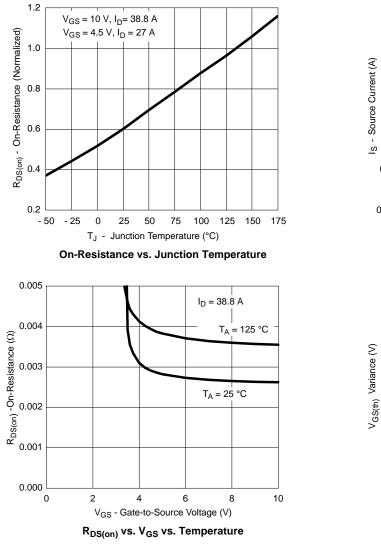
2.4

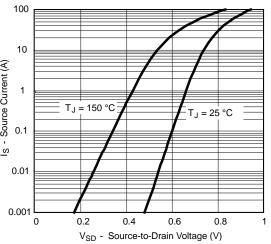
1.8



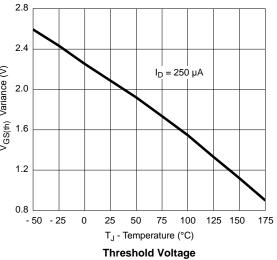


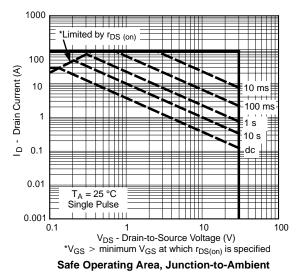




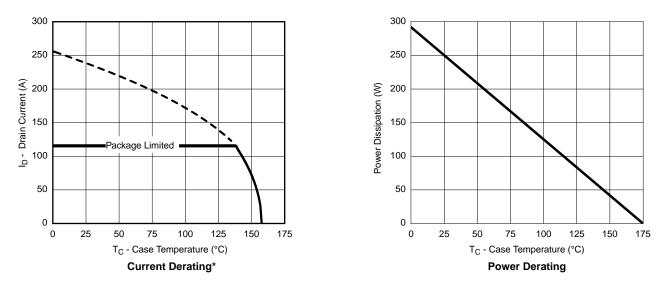


Forward Diode Voltage vs. Temperature



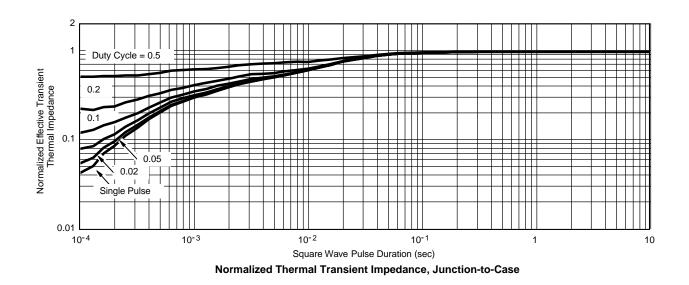






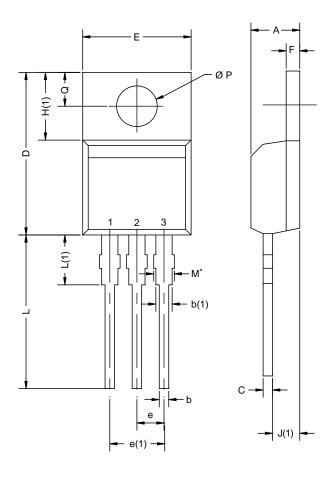
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

*The power dissipation P_D is based on $T_{J(max)} = 175$ °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.





TO-220AB



	MILLIN	IETERS	INCHES		
DIM.	MIN.	MAX.	MIN.	MAX.	
А	4.25	4.65	0.167	0.183	
b	0.69	1.01	0.027	0.040	
b(1)	1.20	1.73	0.047	0.068	
С	0.36	0.61	0.014	0.024	
D	14.85	15.49	0.585	0.610	
E	10.04	10.51	0.395	0.414	
е	2.41	2.67	0.095	0.105	
e(1)	4.88	5.28	0.192	0.208	
F	1.14	1.40	0.045	0.055	
H(1)	6.09	6.48	0.240	0.255	
J(1)	2.41	2.92	0.095	0.115	
L	13.35	14.02	0.526	0.552	
L(1)	3.32	3.82	0.131	0.150	
ØΡ	3.54	3.94	0.139	0.155	
Q	2.60	3.00	0.102	0.118	
ECN: X12- DWG: 547	0208-Rev. N, 1	08-Oct-12			

Notes

* M = 1.32 mm to 1.62 mm (dimension including protrusion) Heatsink hole for HVM



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