

Silicon N-Channel Power MOSFET

Description

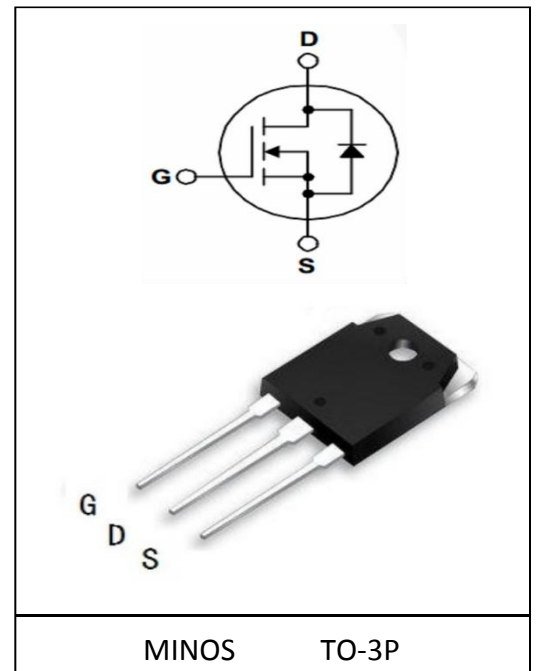
The K3878 uses advanced technology and design to provide excellent $R_{DS(ON)}$. It can be used in a wide variety of applications.

General Features

- ① $V_{DS}=900V$, $R_{dson}<1.15m\Omega$ @ $V_{GS}=10V$, $I_D=9A$ (Typ:0.97 Ω)
- ② Low ON Resistance
- ③ Low Reverse transfer capacitances
- ④ 100% Single Pulse avalanche energy Test

Application

- ① Power switching application
- ② Adapter and charger



Package Marking And Ordering Information:

Ordering Codes	Package	Product Code	Packing
K3878	TO-3P	K3878	Tube

Electrical Characteristics @ $T_a=25^\circ C$ (unless otherwise specified)

Limited Parameters:

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-to-Source Breakdown Voltage	900	V
I_D	Drain Current (continuous) at $T_c=25^\circ C$	9	A
I_{DM}	Drain Current (Pulsed)	36	A
V_{GS}	Gate to Source Voltage	± 30	V
P_{tot}	Total Dissipation at $T_c=25^\circ C$	350	W
T_j	Max. Operating Junction Temperature	175	$^\circ C$
E_{as}	Single Pulse Avalanche Energy	960	mJ

Electrical Parameters:

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{DS}	Drain-source Voltage	$V_{GS}=0V, I_D=250\mu A$	900			V
$R_{DS(on)}$	Static Drain-to-Source on-Resistance	$V_{GS}=10V, I_D=4.5A$		0.97	1.15	Ω
$V_{GS(th)}$	Gated Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	3.0	3.95	5.0	V
I_{DSS}	Drain to Source leakage Current	$V_{DS}=900V, V_{GS}=0V$			1.0	μA
$I_{GSS(F)}$	Gated to Source Forward Leakage	$V_{GS}=+30V$			100	nA
$I_{GSS(R)}$	Gated to Source Reverse Leakage	$V_{GS}=-30V$			-100	nA
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=25V,$ $f=1.0MHz$		2530		pF
C_{oss}	Output Capacitance			215		pF
C_{rss}	Reverse Transfer Capacitance			23		pF
Switching Characteristics						
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=450V, I_D=9A,$ $R_G=25\Omega$		60		nS
t_r	Turn-on Rise Time			130		nS
$t_{d(off)}$	Turn-off Delay Time			130		nS
t_f	Turn-off Fall Time			85		nS
Q_g	Total Gate Charge	$V_{DS}=720V$ $I_D=9A$ $V_{GS}=10V$		60		nC
Q_{gs}	Gate-Source Charge			13		nC
Q_{gd}	Gate-Drain Charge			25		nC
Source-Drain Diode Characteristics						
Symbol	Paramet	Test Conditions	Min	Typ	Max	Unit
I_{SD}	S-D Current(Body Diode)				9	A
I_{SDM}	Pulsed S-D Current(Body Diode)				36	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_{DS}=9A$			1.5	V
t_{rr}	Reverse Recovery Time	$T_J=25^\circ C, I_S=9A$ $di/dt=100A/us$			1000	nS
Q_{rr}	Reverse Recovery Charge				17.0	μC
*Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$						
Symbol	Parameter	Typ			Units	
$R_{\theta JC}$	Junction-to-Case	0.42			$^\circ C/W$	

Typical Performance Characteristics

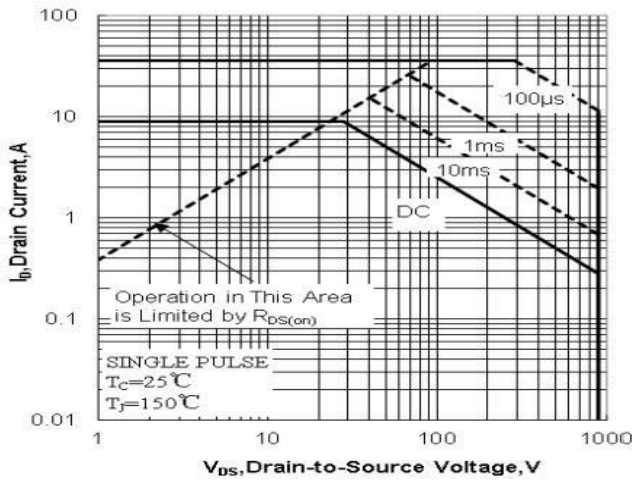


Figure 1 Maximum Forward Bias Safe Operating Area

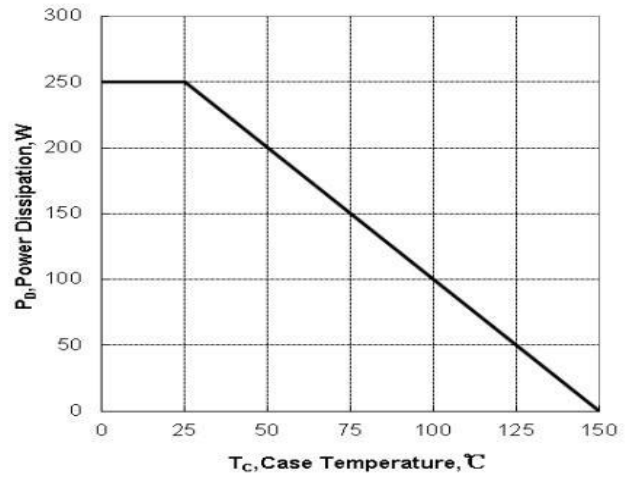


Figure 2 Maximum Power dissipation vs Case Temperature

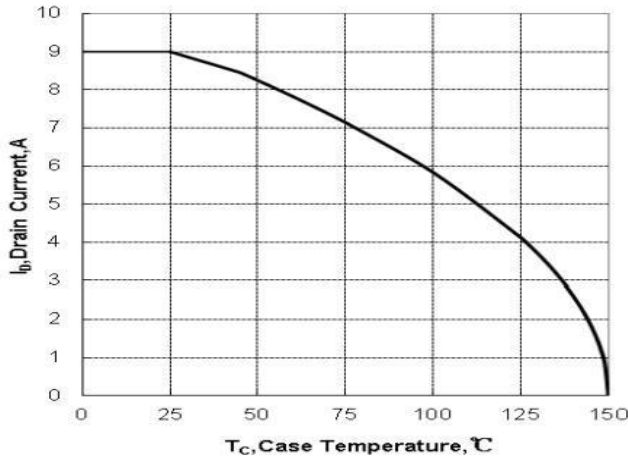


Figure 3 Maximum Continuous Drain Current vs Case Temperature

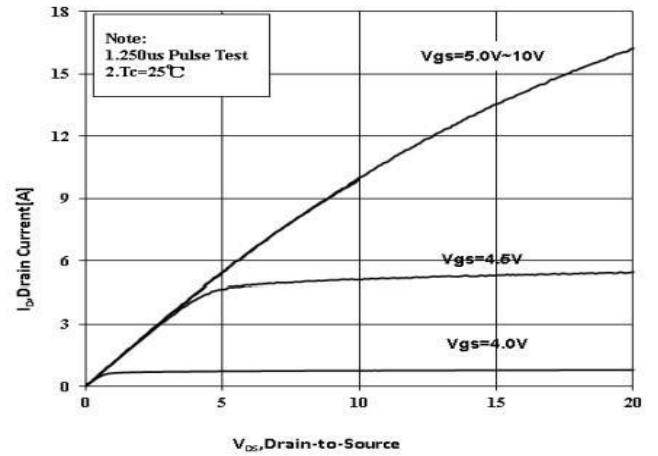


Figure 4 Typical Output Characteristics

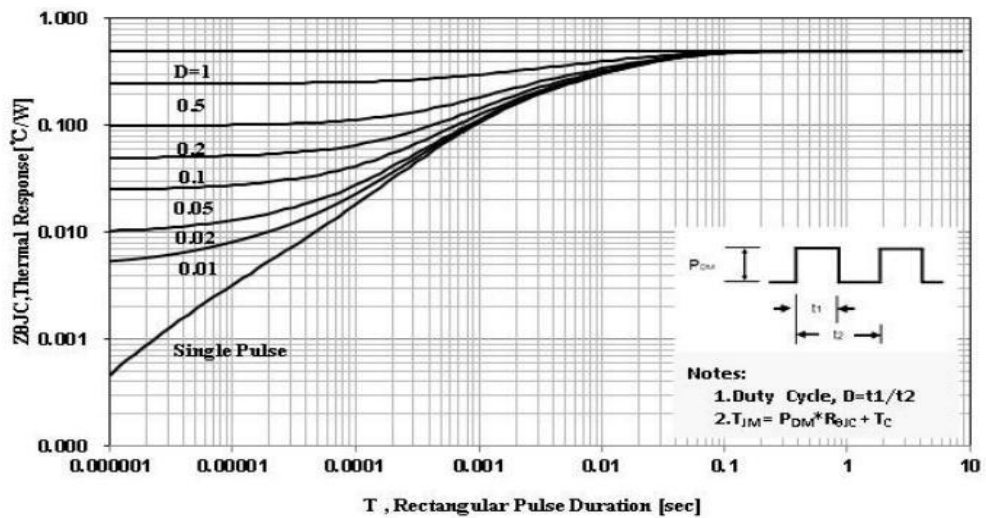


Figure 5 Maximum Effective Thermal Impedance, Junction to Case

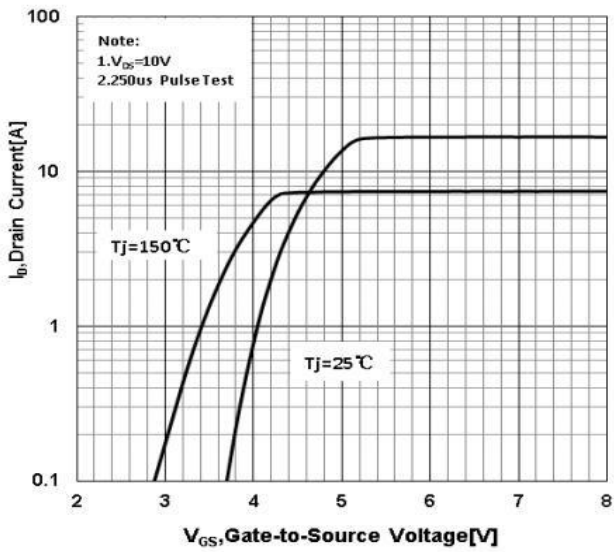


Figure 6 Typical Transfer Characteristics

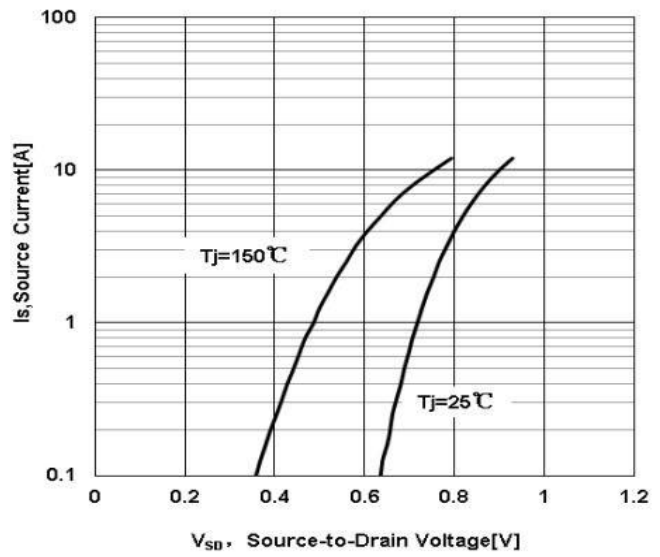


Figure 7 Typical Body Diode Transfer Characteristics

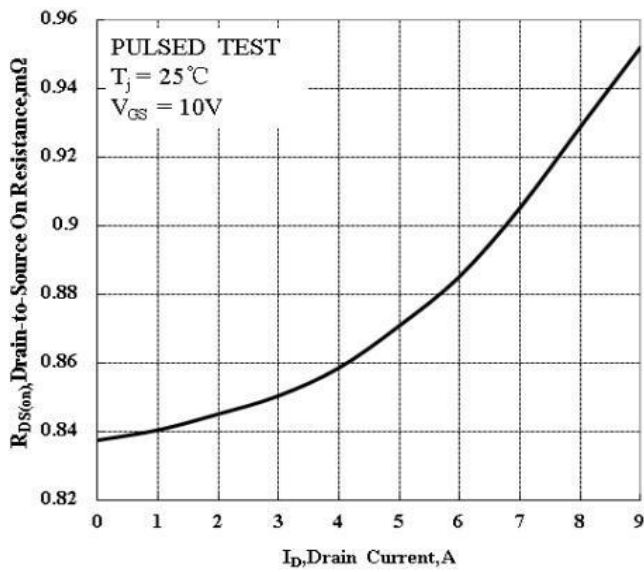


Figure 8 Typical Drain to Source ON Resistance vs Drain Current

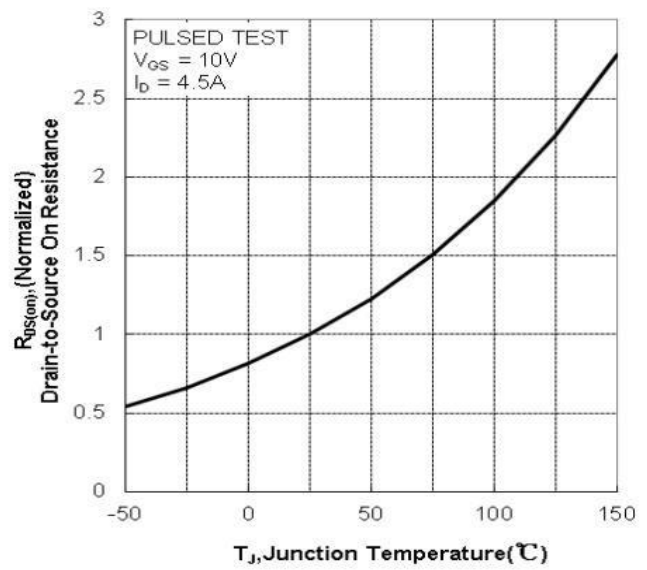


Figure 9 Typical Drain to Source on Resistance vs Junction Temperature

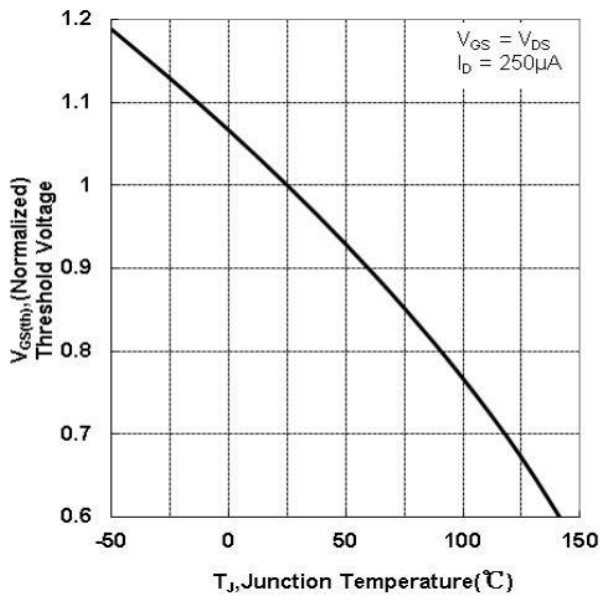


Figure 10 Typical Theshold Voltage vs Junction Temperature

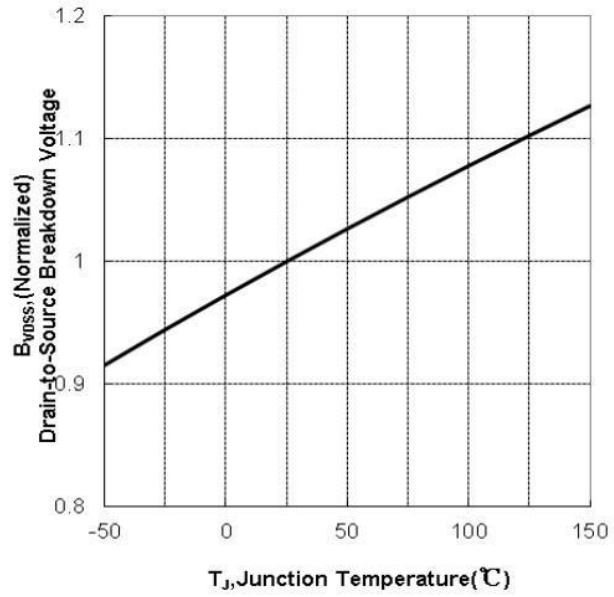


Figure 11 Typical Breakdown Voltage vs Junction Temperature

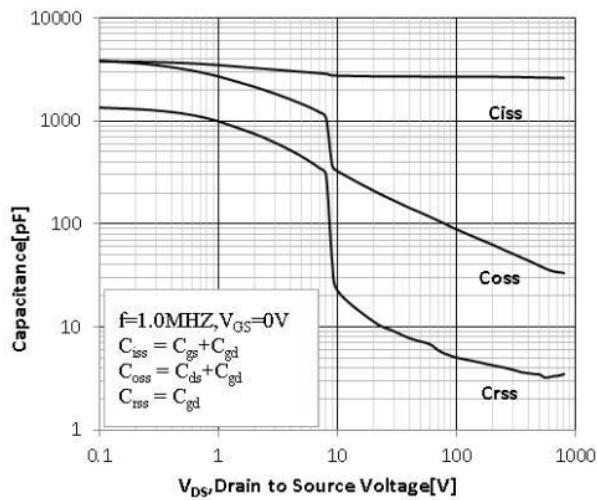


Figure 12 Typical Capacitance vs Drain to Source Voltage

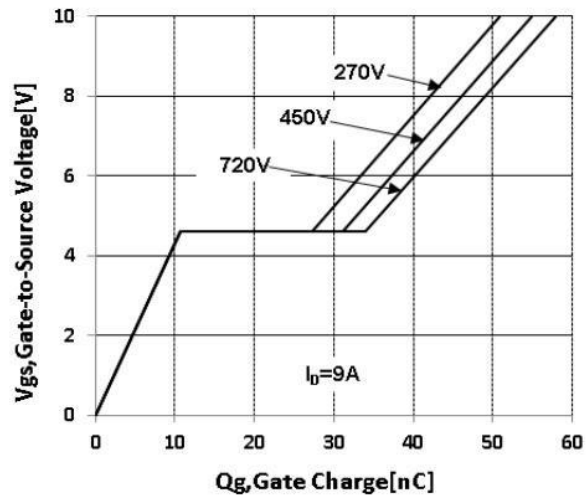
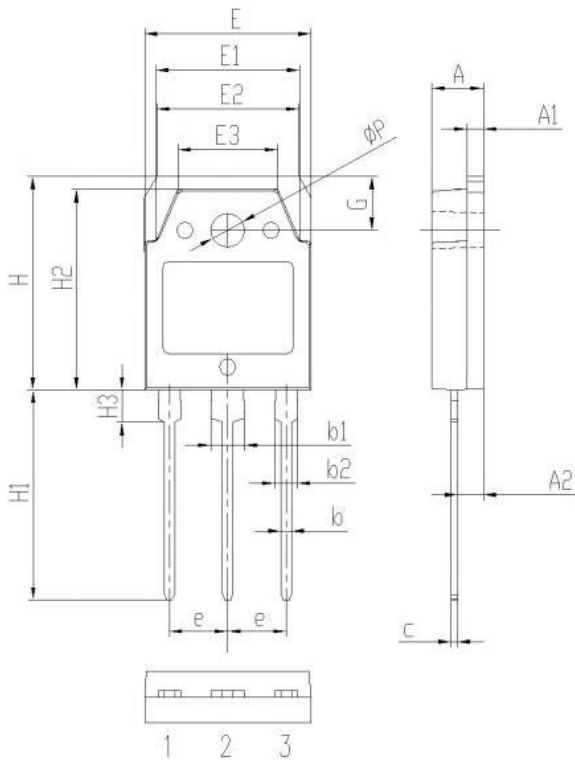


Figure 13 Typical Gate Charge vs Gate to Source Voltage

Package Information

TO-3P PACKAGE



Symbol	Dimensions (millimeters)	
	Min.	Max.
A	4.60	5.00
A1	1.30	1.70
A2	2.20	2.60
b	0.80	1.20
b1	2.90	3.30
b2	1.90	2.30
c	0.40	0.80
e	5.25	5.65
E	15.3	15.7
E1	13.2	13.6
E2	13.1	13.5
E3	9.10	9.50
H	19.7	20.1
H1	19.1	20.1
H2	18.3	18.7
H3	2.80	3.20
G	4.80	5.20
ΦP	3.00	3.40



NOTE:

1. Exceeding the maximum ratings of the device in performance may cause damage to the device, even the permanent failure, which may affect the dependability of the machine. Please do not exceed the absolute maximum ratings of the device when circuit designing.
2. When installing the heat sink, please pay attention to the torsional moment and the smoothness of the heat sink.
3. MOSFETs is the device which is sensitive to the static electricity, it is necessary to protect the device from being damaged by the static electricity when using it.
4. Shenzhen Mnos reserves the right to make changes in this specification sheet and is subject to change without prior notice.

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