

Dual P-Channel 20V Enhancement Mode MOSFET

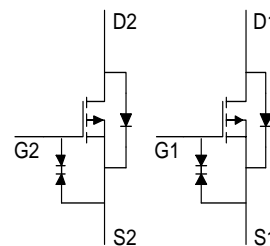
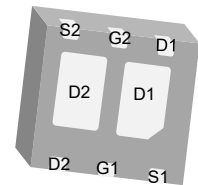
General Features

- Fast Switching Speed
- Low On-Resistance
- Small Footprint
- Typical ESD Protection:2500V
- RoHS Compliant
- Halogen-free Available

Product Summary		
BV _{DSS}	R _{DS(ON)} (Max.)	I _D
-20V	35mΩ @VGS=-4.5V	-4.5A
	50mΩ @VGS=-2.5V	-4.5A
	100mΩ @VGS=-1.8V	-4.5A
	160mΩ @VGS=-1.5V	-1.5A

Applications

- Charger Switches and Load Switches for Portable Devices
- DC/DC Converters


DFN2×2


Ordering Information

Part Number	Package	Marking	Remark
AKF20P45D	DFN2*2	20P45	Halogen Free

Absolute Maximum Ratings		TA=25°C unless otherwise specified	
Symbol	Parameter	Rating	Unit
V _{DSS}	Drain-to-Source Voltage ^[1]	-20	V
I _D	Continuous Drain Current	-4.5	A
I _{DM}	Pulsed Drain Current ^[2]	-15	
P _D	Power Dissipation	7.8	W
V _{GS}	Gate-to-Source Voltage	±8	V
T _L	Soldering Temperature	260	°C
T _J and T _{STG}	Operating and Storage Temperature Range	-55 to 150	

Caution: Stresses greater than those listed in the “Absolute Maximum Ratings” may cause permanent damage to the device.

Thermal Characteristics			
Symbol	Parameter	Rating	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	16	°C/W

Electrical Characteristics OFF Characteristics							TA =25 °C unless otherwise specified
Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	
BV _{DSS}	Drain-to-Source Breakdown Voltage	-20	--	--	V	V _{GS} =0V, I _D =-250μA	
I _{DSS}	Drain-to-Source Leakage Current	--	--	-1	μA	V _{DS} =-20V, V _{GS} =0V	
		--	--	-100	μA	V _{DS} =-20V, V _{GS} =0V T _J =125°C	
I _{GSS}	Gate-to-Source Leakage Current	--	--	15	μA	V _{GS} =+8V, V _{DS} =0V	
		--	--	-15		V _{GS} =-8V, V _{DS} =0V	

Electrical Characteristics ON Characteristics							TA =25 °C unless otherwise specified
Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	
R _{DS(ON)}	Static Drain-to-Source On-Resistance	--	29	35	mΩ	V _{GS} =-4.5V, I _D =-3.8A ^[3]	
		--	35	50	mΩ	V _{GS} =-2.5V, I _D =-3.3A ^[3]	
		--	42	100	mΩ	V _{GS} =-1.8V, I _D =-1A ^[3]	
		--	55	160	mΩ	V _{GS} =-1.5V, I _D =-0.5A ^[3]	
V _{GS(th)}	Gate-to-Source Threshold Voltage	-0.5	--	-1.0	V	V _{GD} =0V, I _D =-250μA	
GFS	Forward Transconductance	--	23	--	S	V _{DS} =-10V, I _{DS} =-3.8A ^[3]	

Dynamic Characteristics							Essentially independent of operating temperature
Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	
Q _G	Total Gate Charge	--	10	--	nC	V _{GS} =-4.5V V _{DS} =-10V, I _D =-4.9A	
Q _{GS}	Gate-to-Source Charge	--	1.5	--			
Q _{GD}	Gate-to-Drain (Miller) Charge	--	2.5	--			

Resistive Switching Characteristics							Essentially independent of operating temperature
Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	
t _{d(ON)}	Turn-on Delay Time	--	18	--	ns	V _{GS} =-4.5V V _{DD} =-10V, I _D =-3.9A R _G =1Ω	
t _{rise}	Rise Time	--	20	--			
t _{d(OFF)}	Turn-off Delay Time	--	35	--			
t _{fall}	Fall Time	--	12	--			

Source-Drain Diode Characteristics						TA=25°C unless otherwise specified
Symbol	Parameter	Min	Typ.	Max.	Units	Test Conditions
I _{SD}	Continuous Source Current		-4.5		A	Integral P-N Diode in MOSFET
I _{SM}	Maximum Pulsed Current		-15		A	
V _{SD}	Diode Forward Voltage	--	--	-1.2	V	I _{SD} =-3.9A ^[3] , V _{GS} =0V

NOTE:

[1] T_J=+25°C to +150°C

[2] Repetitive rating, pulse width limited by maximum junction temperature.

[3] Pulse width≤380μs; duty cycle≤2%.

Typical Characteristics

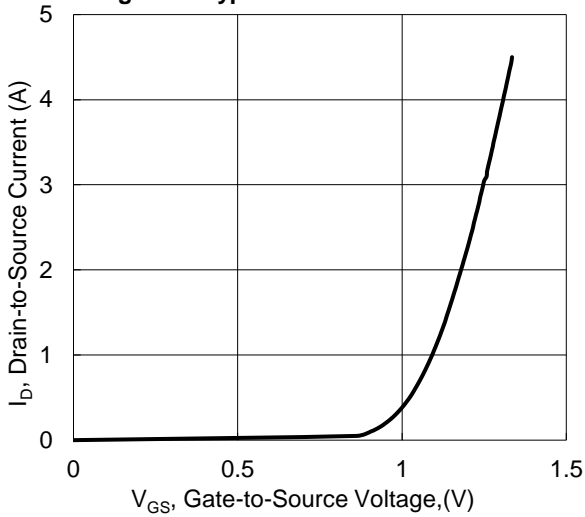
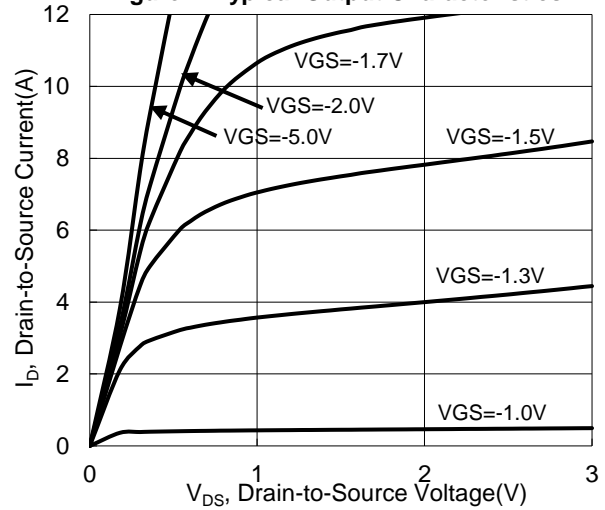
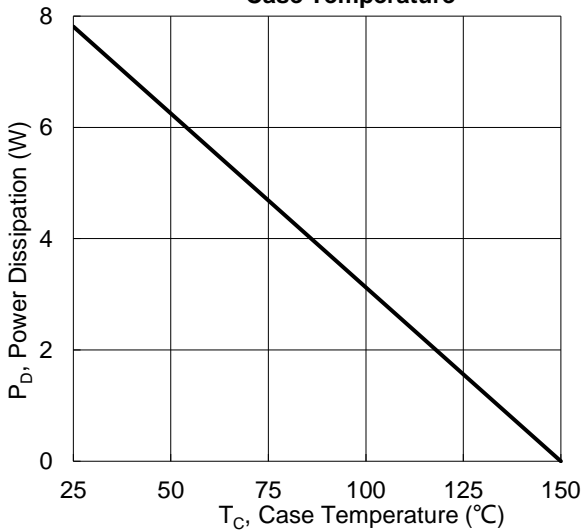
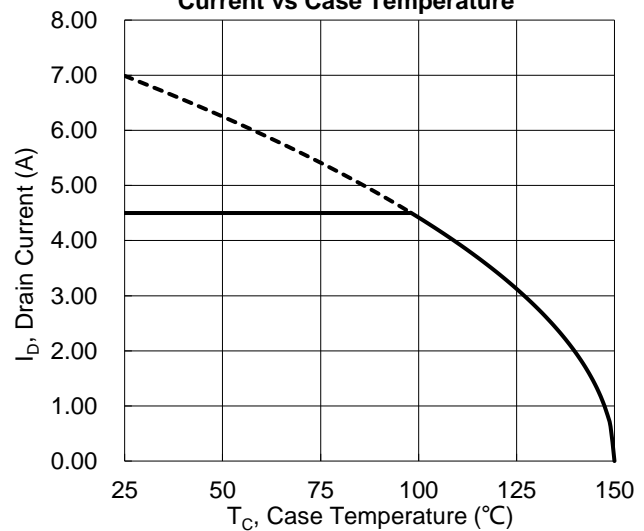
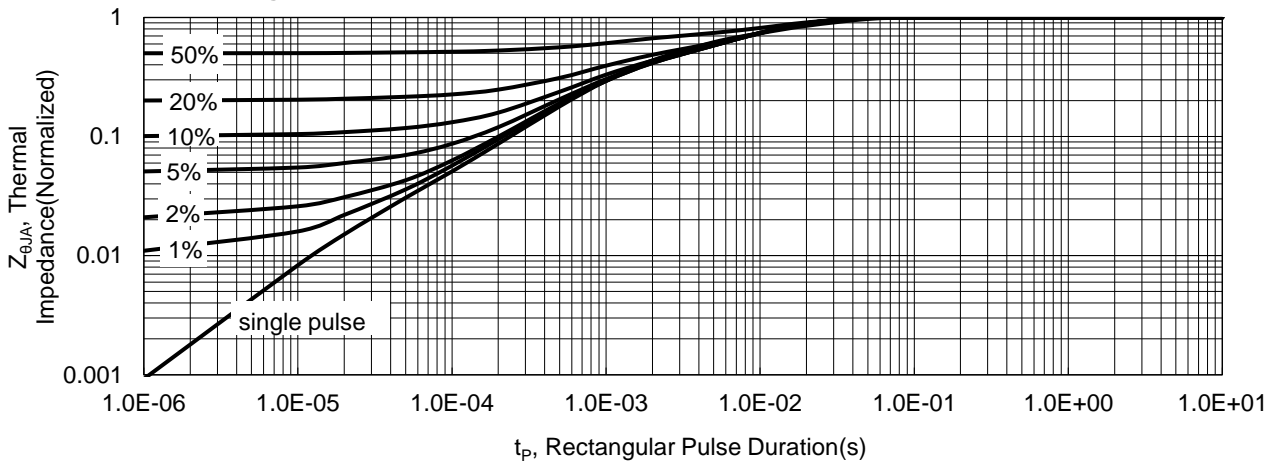
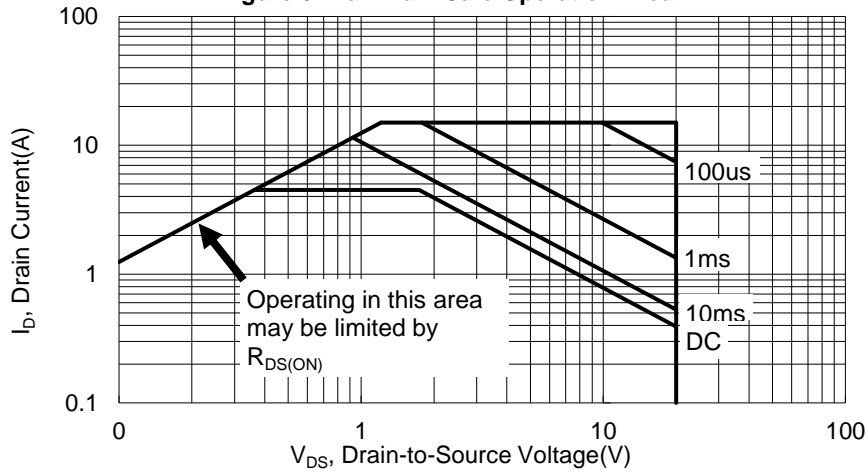
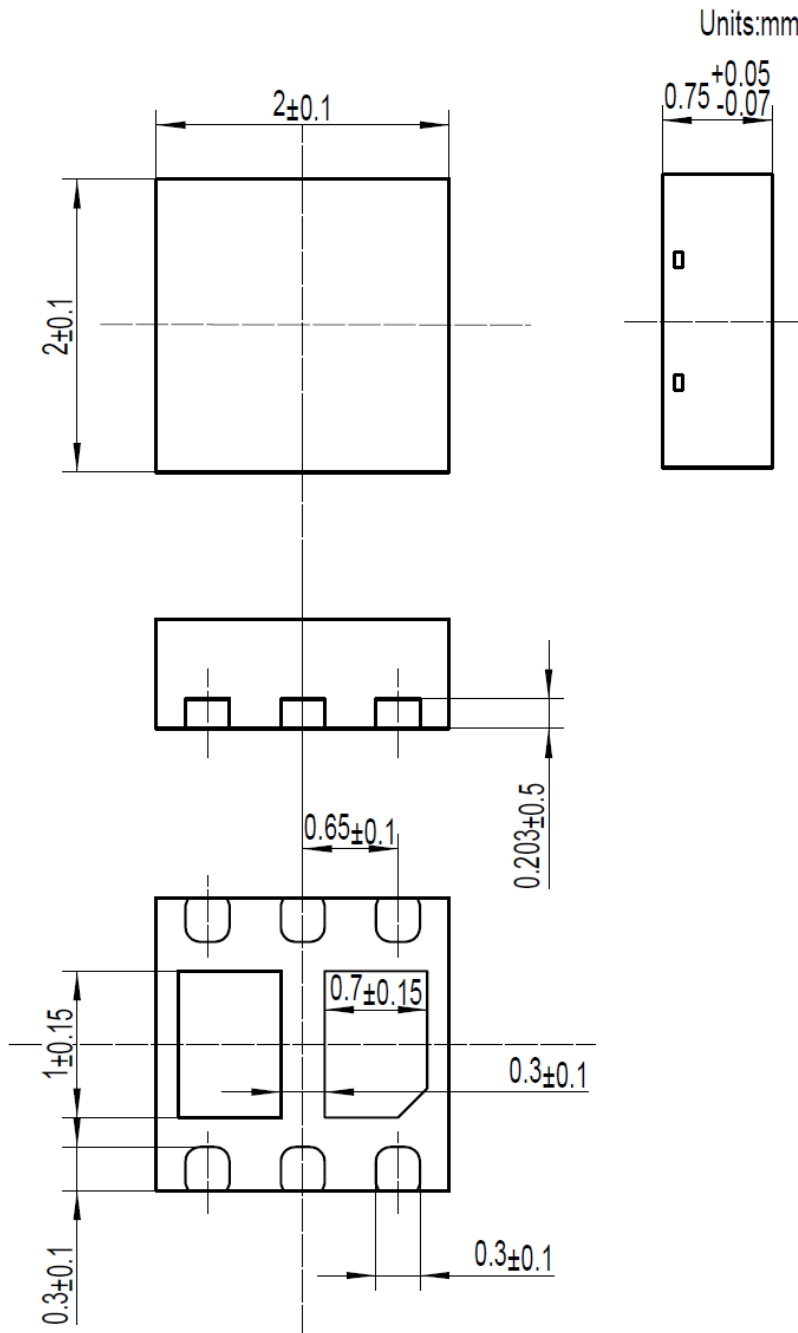
Figure 1. Typical Transfer Characteristics

Figure 2. Typical Output Characteristics

Figure 3. Maximum Power Dissipation vs. Case Temperature

Figure 4. Maximum Continuous Drain Current vs. Case Temperature


Figure 5. Maximum Effective Thermal Impedance, Junction-to-Ambient

Figure 6. Maximum Safe Operation Area


Package Dimensions
DFN 2X2




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