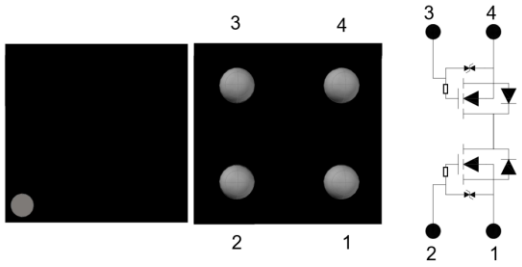
20V Common Drain Dual N-channel Power MOSFET

General Features

- ESD Protection
- Low Gate Charge
- Exceptional on-resistance and maximum DC current capability
- MSL=1
- RoHS Compliant
- Halogen-free available

BV_{DSX}	$R_{DS(ON),\ TYP}$（4.5V）	I_S
20V	23mΩ	6.5A

CSP-4



Applications

- DC/DC Converter
- Power Management
- Load Switch
- Battery Powered System

Ordering Information

Part Number	Package	Marking	Remark
AKC20N30DX	CSP-4	20N30DX	Halogen Free

Absolute Maximum Ratings

TA =25℃ unless otherwise specified

Symbol	Parameter	AKC20N30DX	Unit
V_{SSS}	Source-to-Source Voltage[1]	20	V
V_{GSS}	Gate-to-Source Voltage	±8	V
I_S	Continuous Source Current	6.5	A
	Continuous Source Current at T_A=70℃	5.2	
I_{SM}	Pulsed Source Current at V_{GS}=4.5V[2]	26	
P_D	Power Dissipation	2.0	W
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	AKC20N30DX	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.5	℃/W

Electrical Characteristics

OFF Characteristics

TA =25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV_{SSS}	Source-to-Source Breakdown Voltage	20	--	--	V	V_{GS} = 0V, I_S = 1.0mA
I_{SSS}	Source-to-Source Leakage Current	--	--	1	uA	V_{SS} = 20V, V_{GS} = 0V
I_{GSS}	Gate-to-Source Leakage Current	--	--	±1.0	uA	V_{GS} = ±8.0V, V_{SS} = 0V

ON Characteristics

TA =25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$R_{DS(ON)}$	Static Source-to-Source On-Resistance [3]	20	23	30	mΩ	V_{GS} = 4.5V, I_S = 1.7A
		20.5	24	33		V_{GS} = 4.0V, I_S = 1.7A
		24	27.5	38		V_{GS} = 3.1V, I_S = 1.7A
		25	33	48		V_{GS} = 2.5V, I_S = 1.7A
$V_{GS(TH)}$	Gate Threshold Voltage	0.35	--	1.40	V	V_{SS} = 10V, I_S = 0.16mA

Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
Ciss	Input Capacitance	--	697	--	pF	V_{GS} = 0V, V_{SS} = 10V, f = 1.0MHz
Crss	Reverse Transfer Capacitance	--	41	--		
Coss	Output Capacitance	--	70	--		
Qg	Total Gate Charge	--	9.9	--	nC	V_{SS} = 10V, I_S = 4.0A V_{GS} = 4.0V
Qgs	Gate-to-Source Charge	--	3.0	--		
Qgd	Gate-to-Drain (Miller) Charge	--	2.6	--		

Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(on)}$	Turn-on Delay Time	--	200	--	ns	V_{SS} = 10V V_{GS} = 4.0V R_G = 3.3Ω R_L = 10 Ω I_S = 1.0 A
t_{rise}	Rise Time	--	367	--		
$t_{d(off)}$	Turn-off Delay Time	--	1467	--		
t_{fall}	Fall Time	--	831	--		

Source-Drain Diode Characteristics

TA =25℃ unless otherwise specified

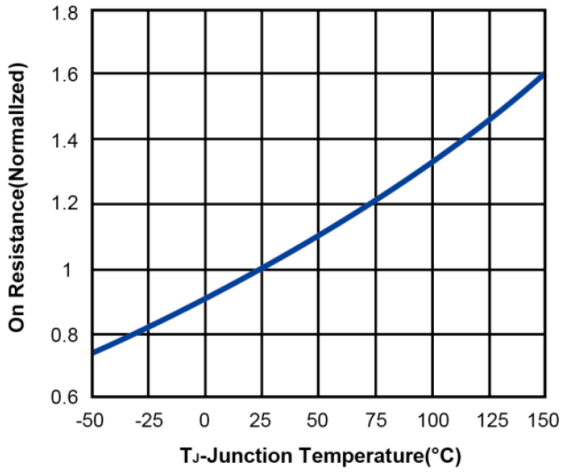
Symbol	Parameter	Min	Typ.	Max.	Units	Test Conditions
V_{FSS}	Forward Source-Source Voltage	--	--	1.2	V	I_S =1.7A, V_{GS} = 0V

NOTE：

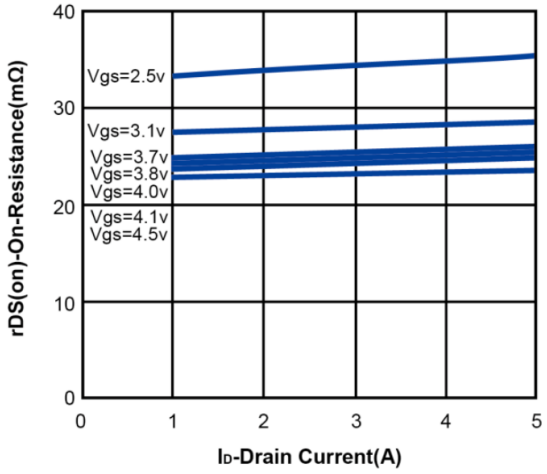
[1] T_J=25℃ to 150℃
[2] Repetitive rating, pulse width limited by maximum junction temperature
[3] Pulse width≤300μs; duty cycle≤2%

Typical Characteristics

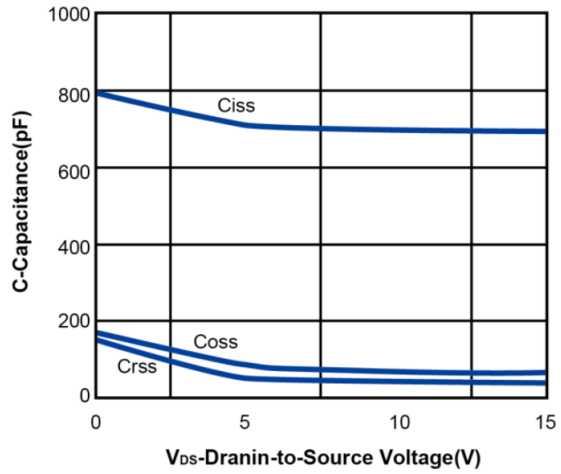
On Resistance vs. Junction Temperature



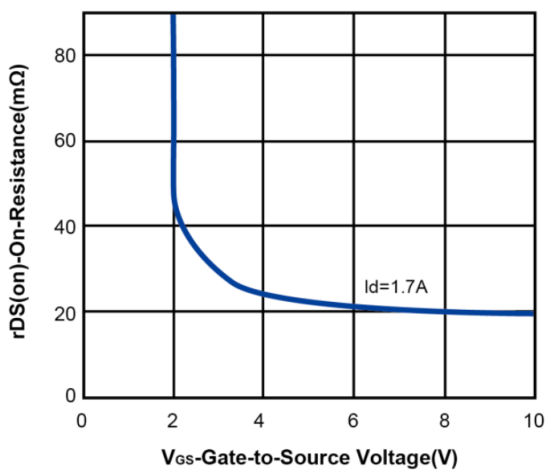
On Resistance vs. Drain Current



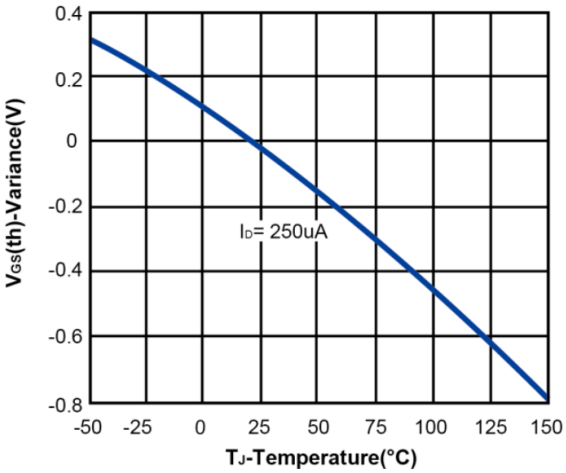
Capacitance



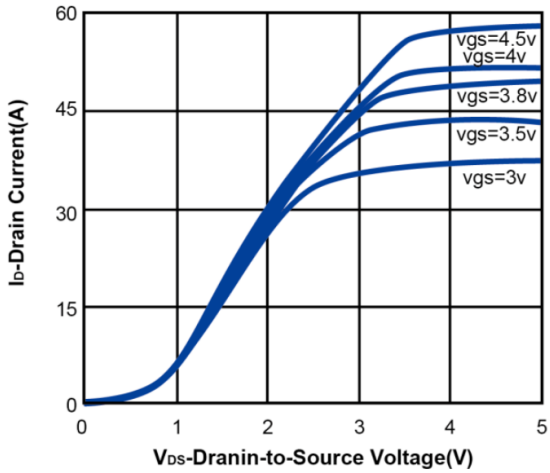
On Resistance vs. Gate-to-Source Voltage



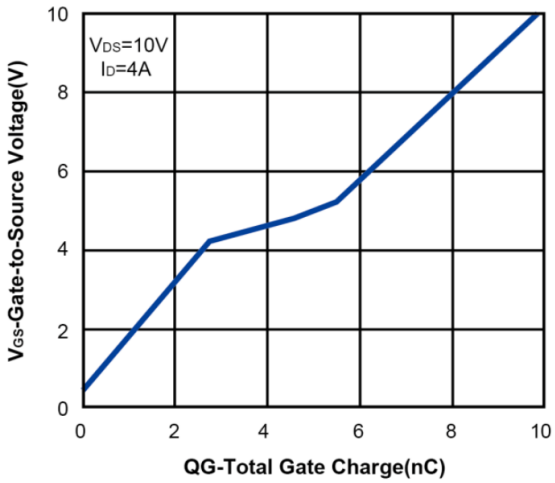
Threshold Voltage



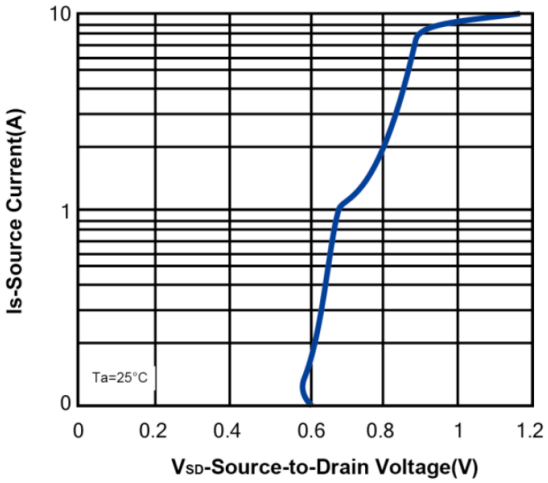
On-Region Characteristics



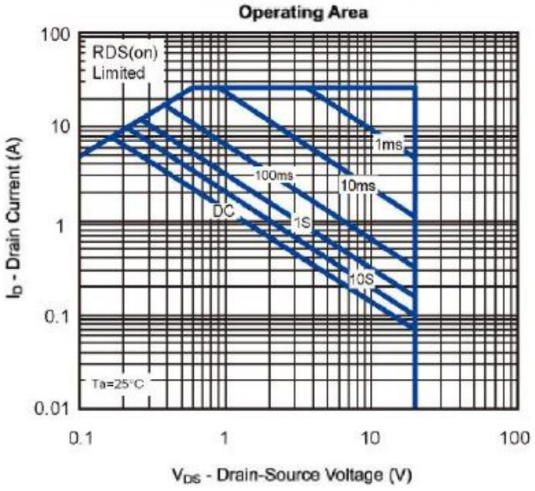
Gate Charge



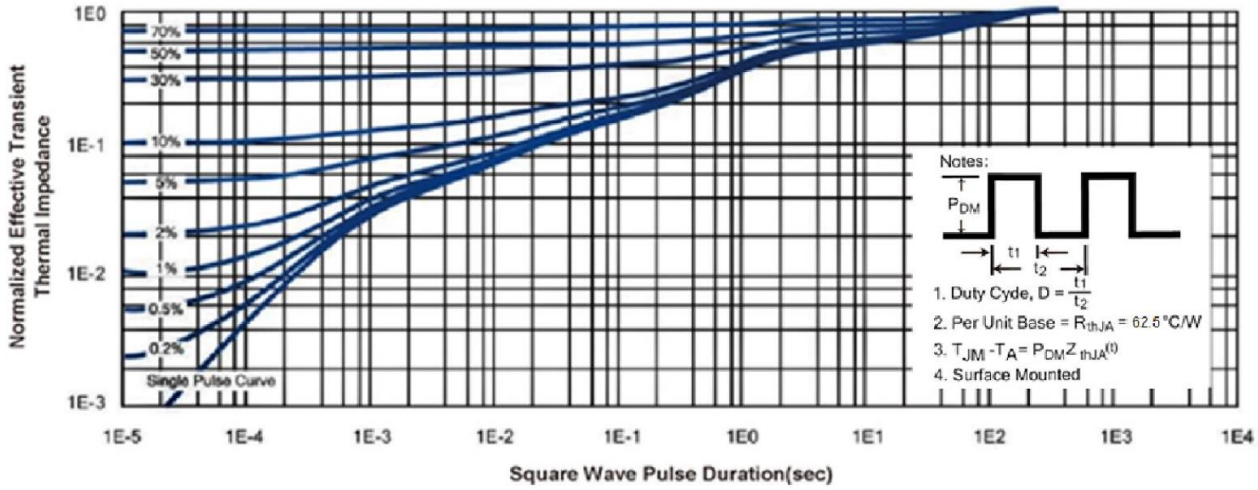
Body-diode characteristics



Maximum Forward Biased Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient



Package Dimensions

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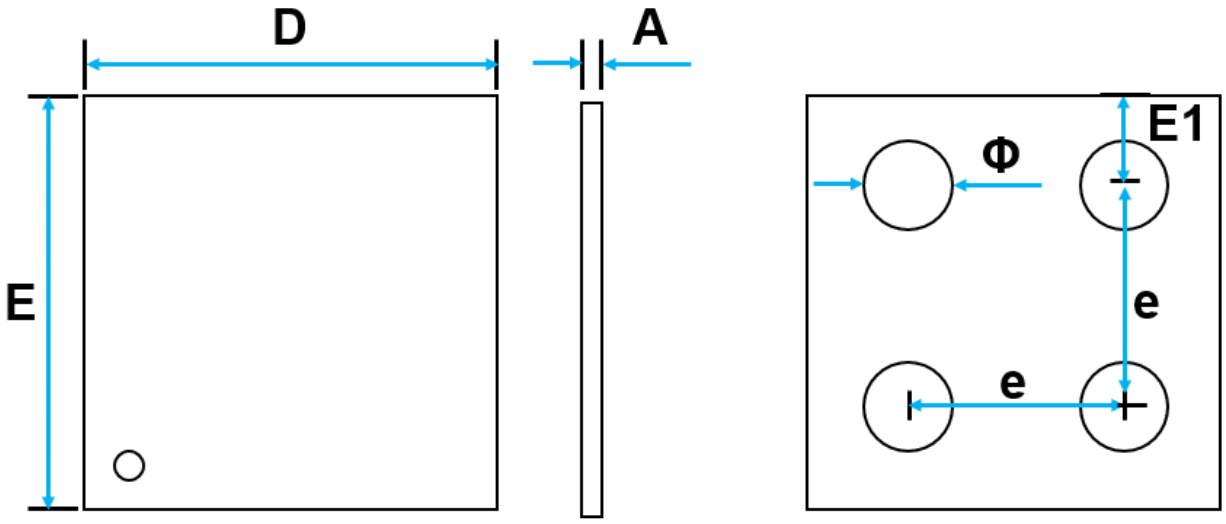

SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	-	0.10	-	-	0.004	-
D	-	1.10	-	-	0.043	-
E	-	1.10	-	-	0.043	-
E1	-	0.23	-	-	0.009	-
e	-	0.65	-	-	0.026	-
ΦP	-	0.30	-	-	0.012	-

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