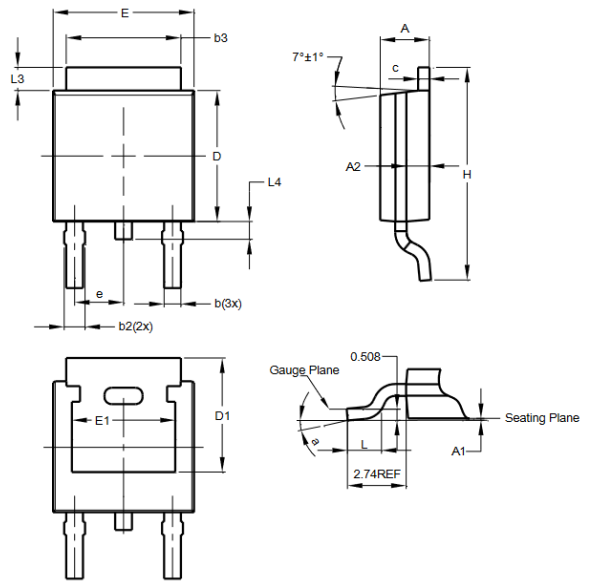
P-Channel Enhancement Mode MOSFET

Primary characteristics			
Symbol	**Parameter**	**Value**	**Unit**
I_D	Continuous drain current max. at T_C=25°C	9.0	A
V_{DSS}	Drain source voltage	60	V
$R_{DS(ON)}$	Static drain-source on-resistance	250	mΩ MAX

Features

- **TO-252 (D-PAK)** case for easy automatic insertion
- Pb-free and **RoHS** compliant
- Super low gate charge
- 100% E_{AS} guaranteed
- Molding compound: UL Flammability Classification Rating 94V-0
- Terminals: matte tin-plated leads; solderability-per MIL-STD-202, method 208

Case dimensions



TO-252 (D-PAK)

	A	A1	A2	b	b2	b3	c	D	D1	e	E
TYP	2.29	0.08	1.07	0.783	0.95	5.33	0.531	6.1	-	2.286 BSC	6.58
MIN	2.19	0	0.97	0.64	0.76	5.21	0.45	6.0	5.21		6.45
MAX	2.39	0.13	1.17	0.88	1.14	5.5	0.58	6.2	-		6.7

	E1	H	L	L3	L4	a	
TYP	9.91	9.91	1.59	1.08	0.83	-	All measurements in mm
MIN	9.40	9.4	1.4	0.88	0.64	0°	
MAX	10.41	10.41	1.78	1.27	1.02	10°	

Maximum ratings (T_A = 25°C unless otherwise noted)			
Characteristic	**Symbol**	**Value**	**Unit**
Drain-source voltage	V_{DSS}	60	V
Gate-source voltage	V_{GSS}	±20	V
Continuous drain current (T_C=25°C)	I_D	9.0	A
Continuous drain current (T_C=100°C)		5.7	
Pulsed drain current [1)]	I_{DM}	36	A
Single pulse avalanche energy [2)]	E_{AS}	11	mJ
Power Dissipation (T_C=25°C)	P_D	29	W
Operating junction temperature range	T_J, T_{STG}	-55 ~ 150	°C

Thermal characteristics

Characteristic	Test condition	Symbol	Value Min.	Value Typ.	Value Max.	Unit
Thermal resistance junction-case	-	$R_{\theta JC}$	-	-	4.3	°C/W
Thermal resistance junction-ambient [3]		$R_{\theta JA}$	-	-	40	

Electrical characteristics (T_A = 25°C)

Characteristic	Test condition	Symbol	Value Min.	Value Typ.	Value Max.	Unit
Drain-source breakdown voltage	V_{GS}=0V, I_D=250µA	V_{DSS}	-	-	60	V
Zero gate voltage drain current	V_{DS}=60V, V_{GS}=0V	I_{DSS}	-	-	1.0	µA
Gate body leakage current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}	-	-	±100	nA
Gate threshold voltage	V_{DS}=V_{GS}, I_D=250µA	$V_{GS(TH)}$	1.0	-	2.5	V
Drain-source on-state resistance [4]	V_{GS}=10V, I_D=9.0A	$R_{DS(ON)}$	-	-	180	mΩ
	V_{GS}=4.5V, I_D=5.0A		-	-	250	

Dynamic electrical characteristics

Characteristic	Test condition	Symbol	Value Min.	Value Typ.	Value Max.	Unit
Input capacitance	V_{DS}=15V V_{GS}=0V f=1.0MHz	C_{ISS}	-	531	-	pF
Output capacitance		C_{OSS}	-	59	-	
Reverse transfer capacitance		C_{RSS}	-	38	-	

Switching characteristics

Characteristic	Test condition	Symbol	Value Min.	Value Typ.	Value Max.	Unit
Turn ON delay time [5]	V_{DS}=15V V_{GS}=10V I_D=1.0A R_G=3.3Ω	$t_{d(ON)}$	-	17.4	-	ns
Turn ON rise time [5]		t_r	-	5.4	-	
Turn OFF delay time [5]		$t_{d(OFF)}$	-	37.2	-	
Turn OFF fall time [5]		t_f	-	2.4	-	
Total gate-charge	V_{DS}=20V V_{GS}=4.5V I_D=6.0A	Q_G	-	4.6	-	nC
Gate to source charge		Q_{GS}	-	1.4	-	
Gate to drain (Miller) charge		Q_{GD}	-	1.62	-	

Source-drain diode characteristics

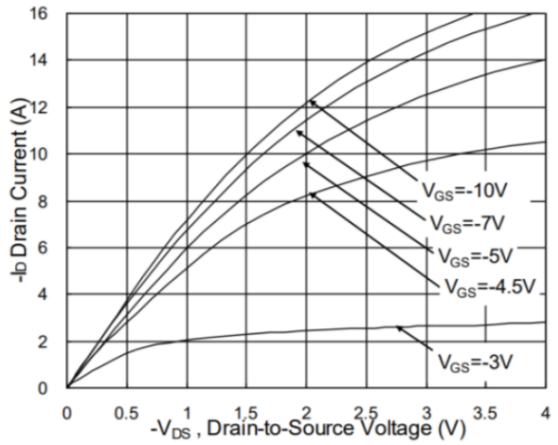
Characteristic	Test condition	Symbol	Value Min.	Value Typ.	Value Max.	Unit
Diode forward voltage [6]	I_{SD}=9.0A, V_{GS}=0V, T_J=25°C	V_{SD}	-	-	1.2	V

Notes:

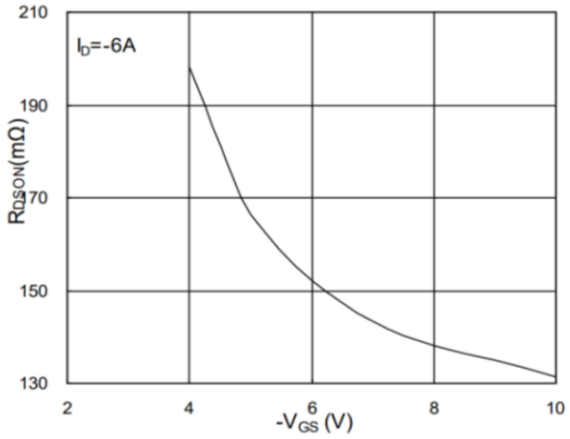
1) Measured at t_p=10µs, T_C=25°C
2) The E_{AS} data shows max. rating. The test condition is V_{DD}=30V, V_{GS}=10V, L=0.5mH
3) The data tested by surface mounted on a 1 inch^2 FR-4 board with 2oz copper
4) The data tested by pulse, width ≤300µs, duty cycle ≤2%
5) Guaranteed by design, not subject to production

Typical characteristics

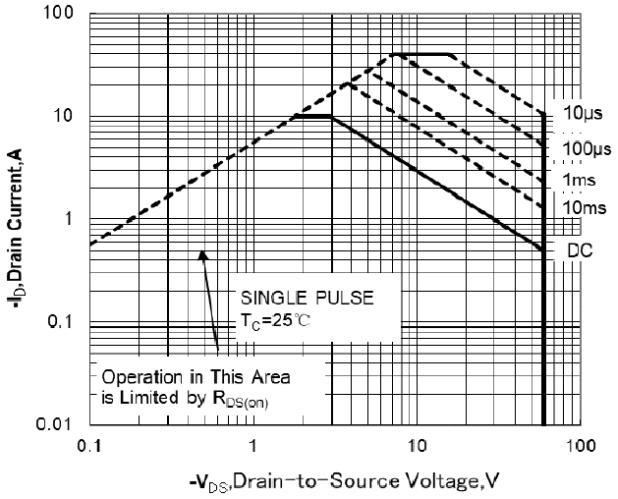
Typical output characteristics



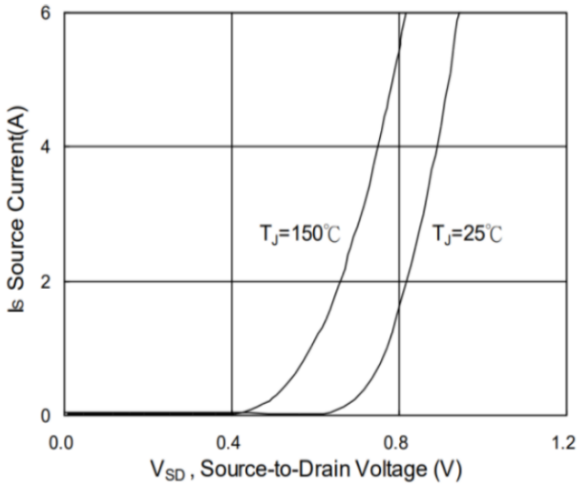
On-resistance vs. gate-source voltage



Safe operation area

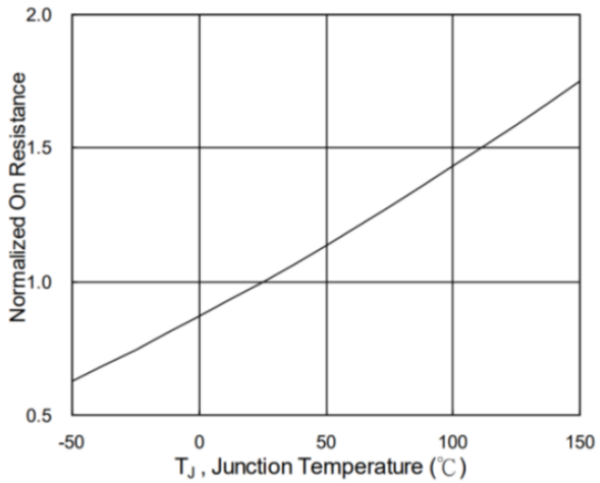


Body-diode characteristics

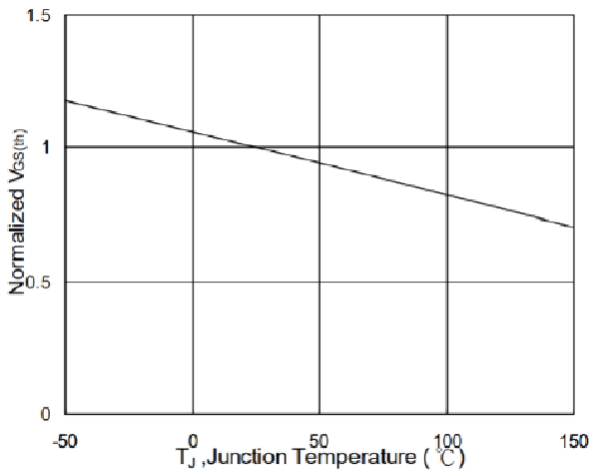


Typical characteristics

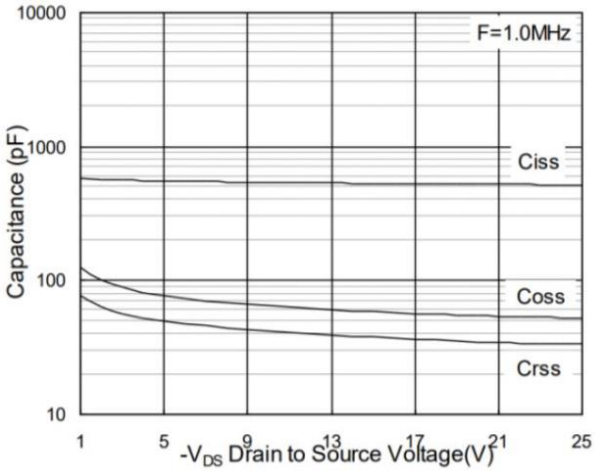
Normalized ON-resistance vs. junction temperature



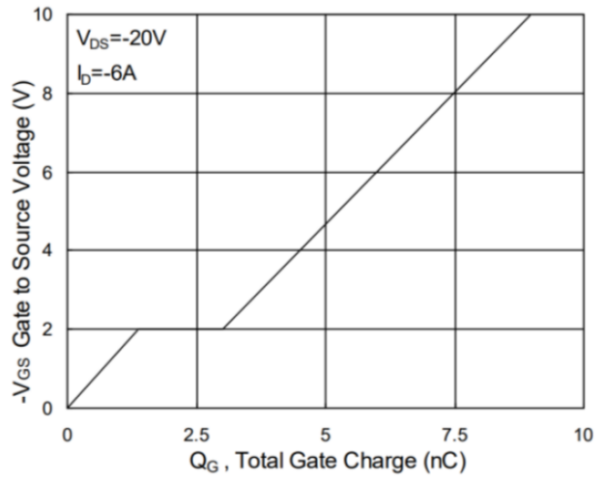
Normalized $V_{GS(TH)}$ vs. junction temperature



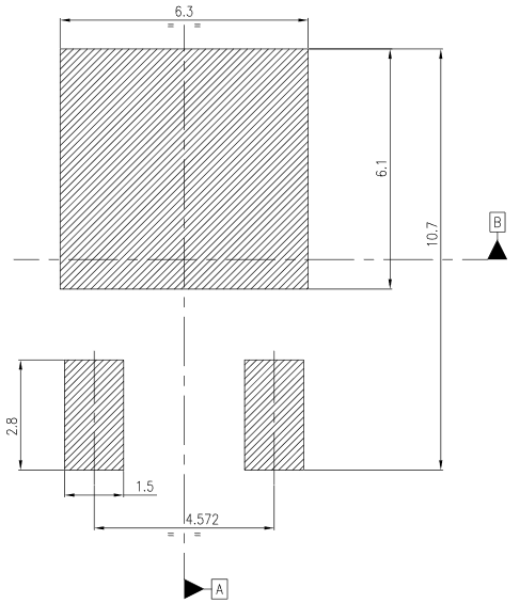
Capacitance characteristics



Gate-charge characteristics



Suggested soldering pad layout



TO-252 (D-PAK)

Ordering information

Part Number	Marking	Package	Shipping Quantity	Dimensions
AKS9P06XD	9P06XD	TO-252	**80 pcs / tube** **2500 pcs / tape & reel**	---

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