

-60V_{DS}/±20V_{GS} P-Channel Advanced Mode MOSFET
Features

- $V_{DS}=-60V, I_D=-6A$
- $R_{DS(ON)}=70m\Omega$ (TYP.) $V_{GS}=-10V$
- $R_{DS(ON)}=100m\Omega$ (TYP.) $V_{GS}=-4.5V$
- Fast Switching
- Low On-Resistance

Applications

- Switch switching
- Power management in portable/desktop PCs

Ordering Information

Device	package	Device Marking	Package Qty.
HM4421	SOP-8	**	3000/PCS

Absolute Maximum Ratings ($T_a=25^\circ C$, unless otherwise noted)

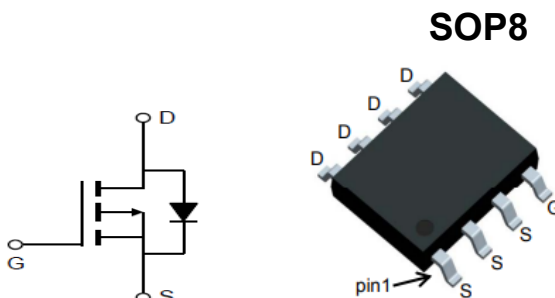
Parameter	Symbol	Value	Unit
Drain-Source Voltage ($V_{GS}=0V$)	V_{DS}	-60	V
Gate-Source Voltage ($V_{GS}=0V$, static)	V_{GS}	±20	V
Continuous Drain Current ($T_a=25^\circ C$)	I_D	-6	A
Continuous Drain Current ($T_a=70^\circ C$)		-4.5	A
Pulsed Drain Current	I_{DM}	-80	A
Avalanche Energy, Single Pulsed	E_{AS}	135	mJ
Maximum Power Dissipation ($T_a=25^\circ C$)	P_D	3.1	W
Maximum Power Dissipation ($T_a=70^\circ C$)		2	W
Operating, Storage Temperature Range	T_J, T_{STG}	-55~150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	-	75	-	$^\circ C/W$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	-	24	-	$^\circ C/W$

Electrical Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-30V, V_{GS}=0V$	-	-	-1	μA
Gate -Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.4	-1.9	-2.4	V
Drain-Source On-stage Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-1A$	-	60	80	m Ω
		$V_{GS}=-4.5V, I_D=-1A$	-	90	130	



Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	$V_{DS}=-15V$ $V_{GS}=0V$ $f=1MHz$	-	2417	-	pF
Output capacitance	C_{oss}		-	179	-	
Reverse transfer capacitance	C_{rss}		-	120	-	
Gate Resistance	R_g	$f=1MHz$	-	2	-	Ω
Total Gate Charge	Q_g	$V_{DS}=-15V$ $V_{GS}=-10V$ $I_D=-15A$	-	46	-	nC
Gate Source Charge	Q_{gs}		-	15.5	-	
Gate Drain Charge	Q_{gd}		-	18	-	
Turn-on delay Time	$t_{d(on)}$	$V_{GS}=-10V$ $V_{DS}=-15V$ $R_L=1\Omega$ $R_G=3\Omega$	-	14	-	ns
Rise time	t_r		-	16	-	
Turn-off delay Time	$t_{d(off)}$		-	74	-	
Fall time	t_f		-	37	-	
Body Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_{SD}=-1A$	-	-0.8	-1	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_{SD}=-15A$ $dI/dt=100A/\mu s$	-	37	-	ns
Reverse Recovery Charge	Q_{rr}		-	5.3	-	nC

Electrical Characteristics Diagrams

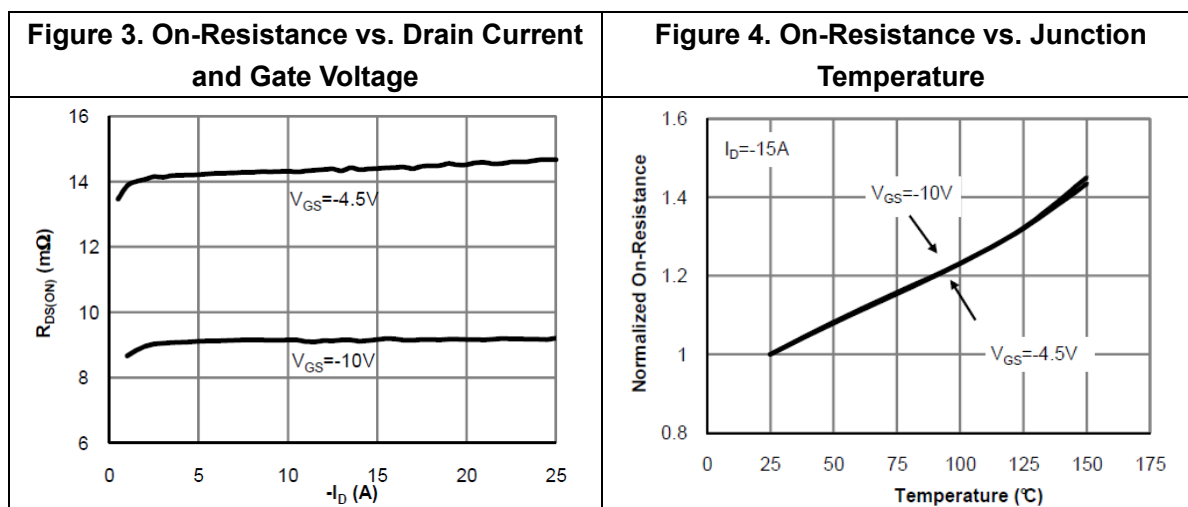
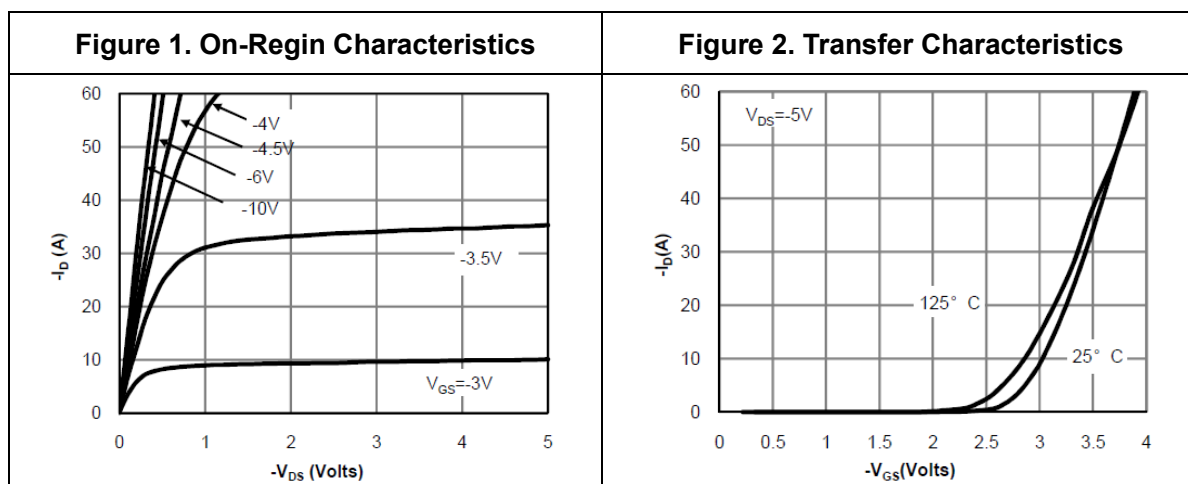
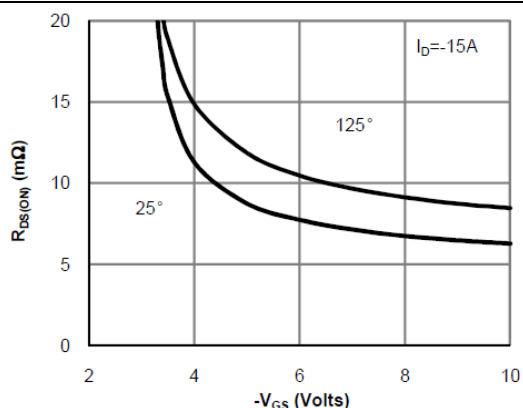
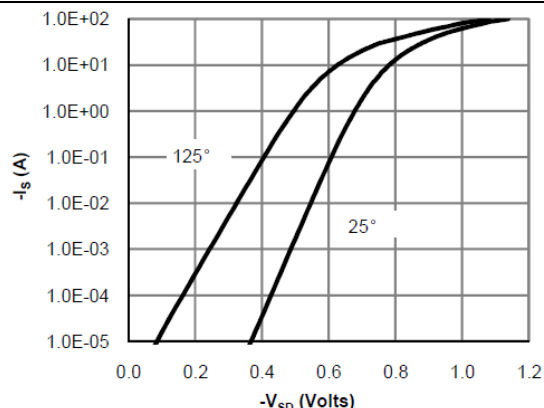
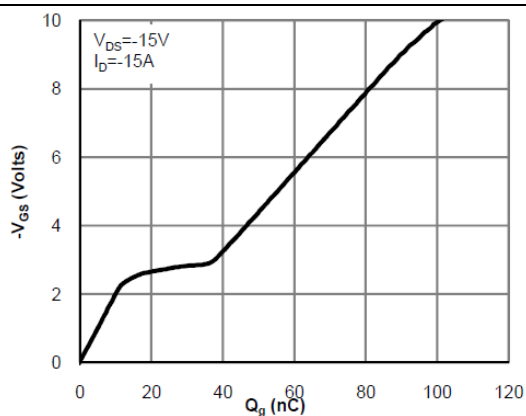
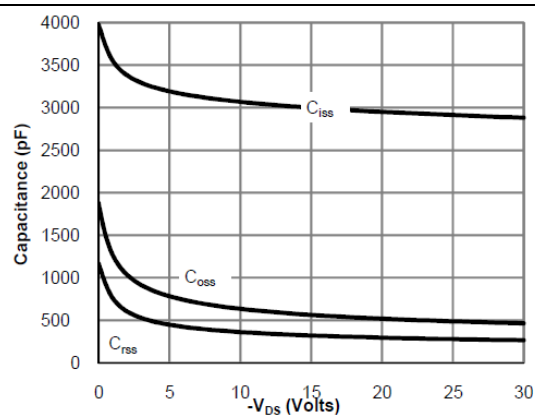
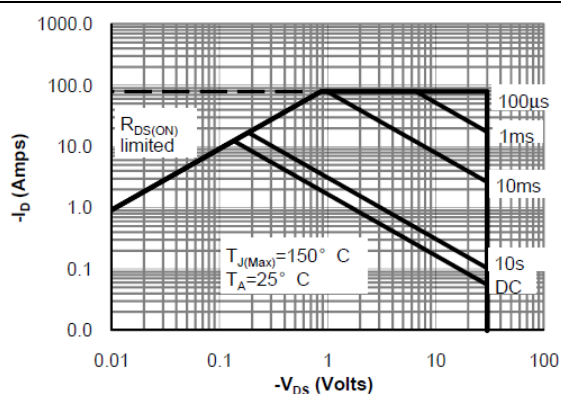
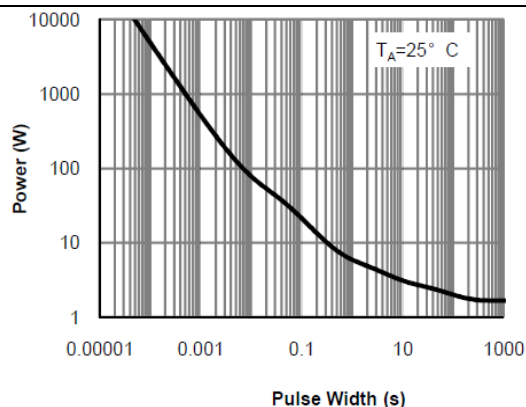
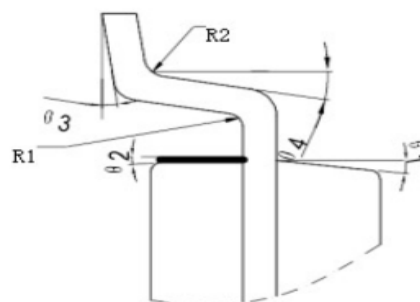
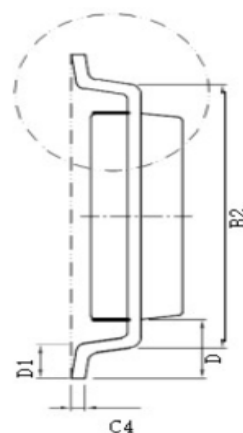
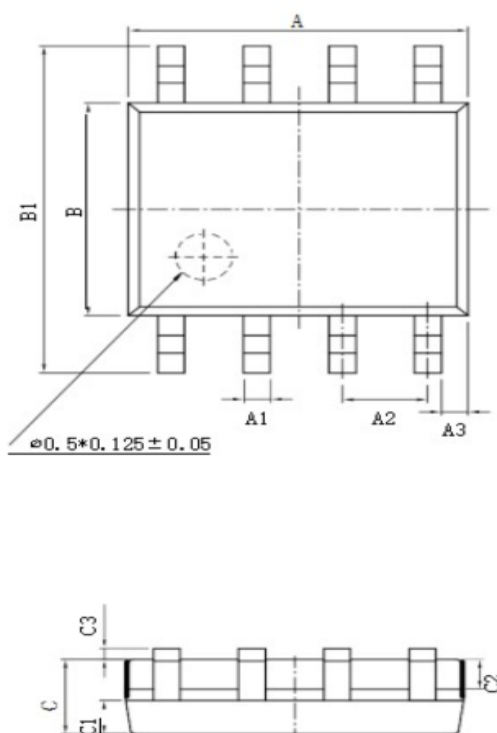


Figure 5. On-Resistance vs. Gate-Source Voltage

Figure 6. Body-Diode Characteristics

Figure 7. Gate-Charge Characteristics

Figure 8. Capacitance Characteristics

Figure 9. Maximum Forward Biased Safe Operating Area

Figure 10. Single Pulse Power Rating Junction-to-Ambient


Physical Dimensions
SOP8


符号	尺寸 (mm)		符号	尺寸 (mm)	
	最小值	最大值		最小值	最大值
A	4.80	5.00	C3	0.05	0.20
A1	0.356	0.456	C4	0.203	0.233
A2	1.27 TYP		D	1.05 TYP	
A3	0.345 TYP		D1	0.40	0.80
B	3.80	4.00	R1	0.20 TYP	
B1	5.80	6.20	R2	0.20 TYP	
B2	5.00 TYP		$\theta 1$	17° TYP4	
C	1.30	1.60	$\theta 2$	13° TYP4	
C1	0.55	0.65	$\theta 3$	0° ~ 8°	
C2	0.55	0.65	$\theta 4$	4° ~ 12°	

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