

N AND P-CHANNEL ENHANCEMENT MODE POWER MOSFET N 加 P 沟道增强型 MOS 管

N-CH $V_{DS}=40V$

$R_{DS(ON)}$, $V_{GS}@10V$, $I_{DS}@6.0A = 31m\Omega$

$R_{DS(ON)}$, $V_{GS}@4.5V$, $I_{DS}@5.0A = 45m\Omega$

P-CH $V_{DS}= -40V$

$R_{DS(ON)}$, $V_{GS}@-10V$, $I_{DS}@-5.0A = 45m\Omega$

$R_{DS(ON)}$, $V_{GS}@-4.5V$, $I_{DS}@-4.0A = 63m\Omega$

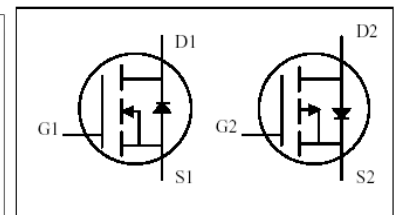
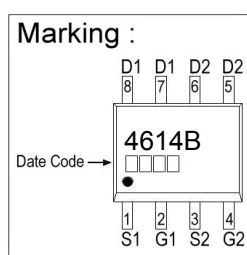
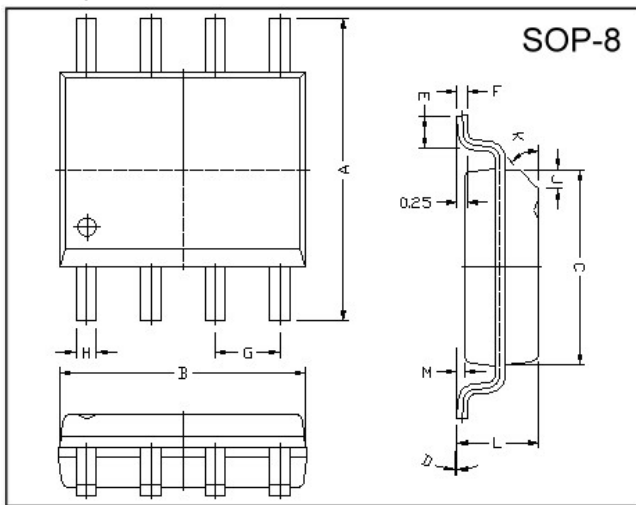
Features 特性

Advanced trench process technology 高级的加工技术

High Density Cell Design For Ultra Low On-Resistance 极低的导通电阻高密度的单元设计

Improved Shoot-Through FOM 改良的成形工艺

Package Dimensions 封装尺寸及外形图



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.80	6.20	M	0.10	0.25
B	4.80	5.00	H	0.35	0.49
C	3.80	4.00	L	1.35	1.75
D	0°	8°	J	0.375 REF.	
E	0.40	0.90	K	45°	
F	0.19	0.25	G	1.27 TYP.	

Maximum Ratings and Thermal Characteristics (TA = 25°C unless otherwise noted) 25°C 极限参数和热特性

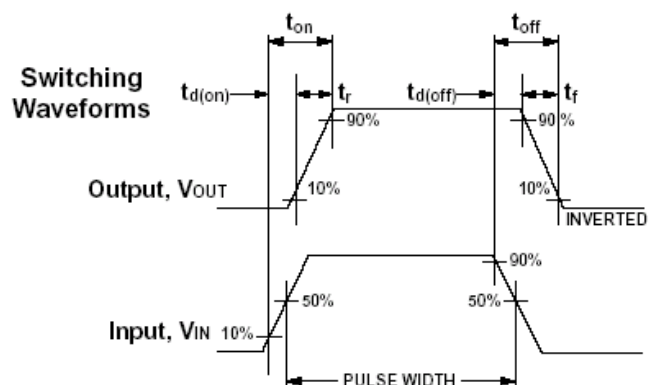
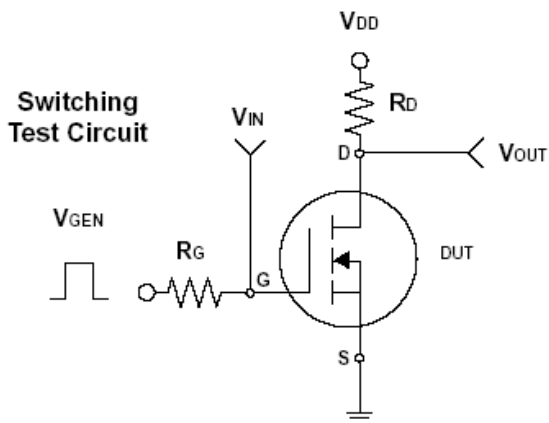
Parameter 极限参数	Symbol 符号	Ratings 等级		Unit 单位
		N-沟道	P-沟道	
Drain-Source Voltage 漏源电压	V_{DS}	40	-40	V
Gate-Source Voltage 栅源电压	V_{GS}	±20	±20	V
Continuous Drain Current 连续漏极电流	$I_D @TA=25^{\circ}C$	6.0	-5.0	A
Continuous Drain Current 连续漏极电流	$I_D @TA=70^{\circ}C$	5.0	-4.0	A
Pulsed Drain Current 脉冲漏极电流	I_{DM}	20	-20	A
Total Power Dissipation 功耗	$P_D @TA=25^{\circ}C$	2.1		W
Linear Derating Factor 线性因子		0.016		W/°C
Operating Junction and Storage Temperature Range 使用及储存温度	T_j, T_{stg}	-55 ~ +150		°C

N-Channel Electrical Characteristics (Tj = 25°C unless otherwise specified)

N 沟道电气特性 25°C

Parameter 参数	符号	Test Condition 测试条件	最小值	典型值	最大值	单位
Static 静态参数						
Drain-Source Breakdown Voltage 漏源击穿电压	BV _{DSS}	V _{GS} = 0V, I _D = 250uA	40			V
Drain-Source On-State Resistance 漏源导通电阻	R _{DS(on)}	V _{GS} = 4.5V, I _D = 5.0A		33.0	45.0	mΩ
Drain-Source On-State Resistance 漏源导通电阻	R _{DS(on)}	V _{GS} = 10V, I _D = 6.0A		23.0	31.0	
Gate Threshold Voltage 开启电压	V _{GS(th)}	V _{DS} =V _{GS} , I _D = 250uA	1	1.8	3	V
Zero Gate Voltage Drain Current 零栅压漏极电流	I _{DSS}	V _{DS} = 40V, V _{GS} = 0V			1	uA
Gate Body Leakage 漏极短路时截止栅电流	I _{GSS}	V _{GS} = ± 20V, V _{DS} = 0V			± 100	nA
Forward Transconductance 正向跨导	g _{fs}	V _{DS} = 5V, I _D = 5A		17	—	S
Dynamic 动态参数						
Total Gate Charge 栅极总电荷	Q _g	V _{DS} = 20V, I _D = 1.5A V _{GS} = 10V		14.5		nC
Gate-Source Charge 栅-源极电荷	Q _{gs}			1.5		
Gate-Drain Charge 栅-漏极电荷	Q _{gd}			3.5		
Turn-On Delay Time 导通延迟时间	t _{d(on)}	V _{DD} = 20V, R _L = 5 Ω I _D = 1A, V _{GEN} = 10V R _G = 3 Ω		10.5		ns
Turn-On Rise Time 导通上升时间	t _r			16.05		
Turn-Off Delay Time 关断延迟时间	t _{d(off)}			39		
Turn-Off Fall Time 关断下降时间	t _f			10		
Input Capacitance 输入电容	C _{iss}	V _{DS} = 20V, V _{GS} = 0V f = 1.0 MHz		745		pF
Output Capacitance 输出电容	C _{oss}			65.7		
Reverse Transfer Capacitance 反向传输电容	C _{rss}			53.35		
Source-Drain Diode 源漏二极管参数						
Max. Diode Forward Current 最大正向电流	I _S				4.3	A
Diode Forward Voltage 正向电压	V _{SD}	I _S = 1A, V _{GS} = 0V			1.3	V

Note: Pulse test: pulse width ≤ 300μs, duty cycle ≤ 2% 注意: 脉冲测试: 脉冲宽度 ≤ 300μs 死区 ≤ 2%



N-Channel Characteristics Curve N 沟道电气性能特征曲线

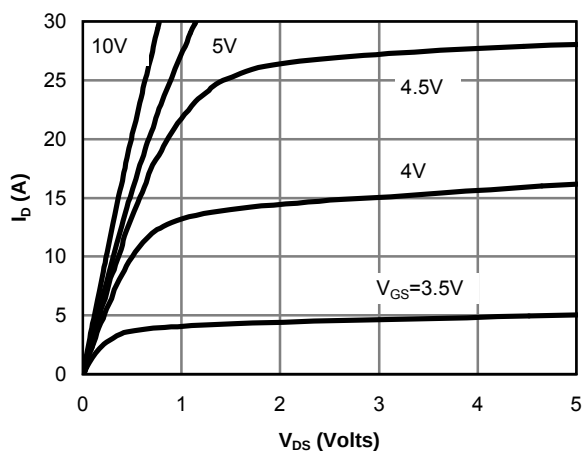


Figure 1: On-Region Characteristics

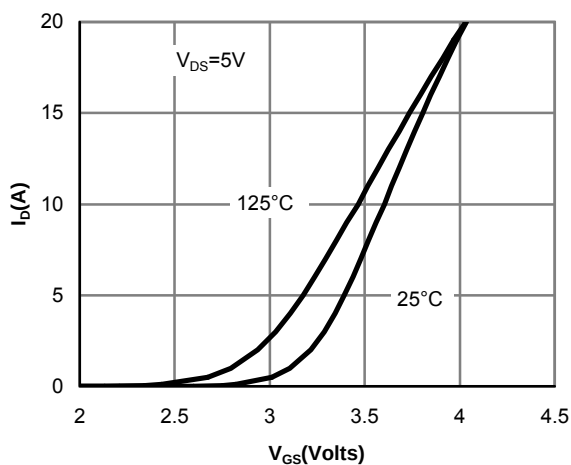


Figure 2: Transfer Characteristics

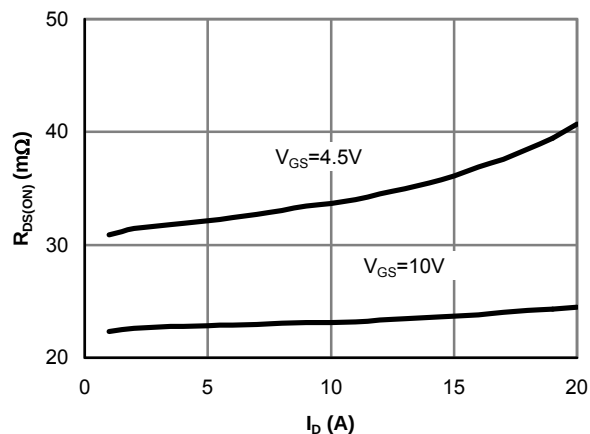


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

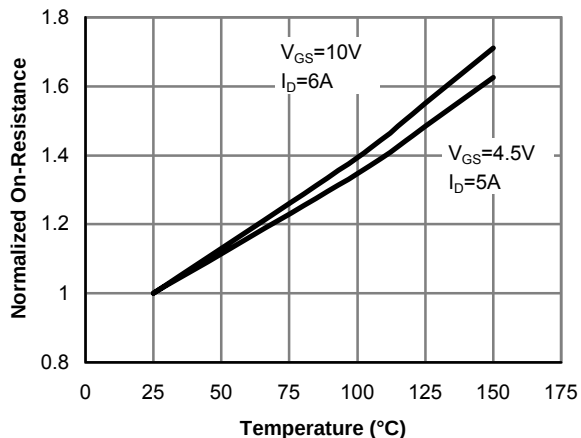


Figure 4: On-Resistance vs. Junction Temperature

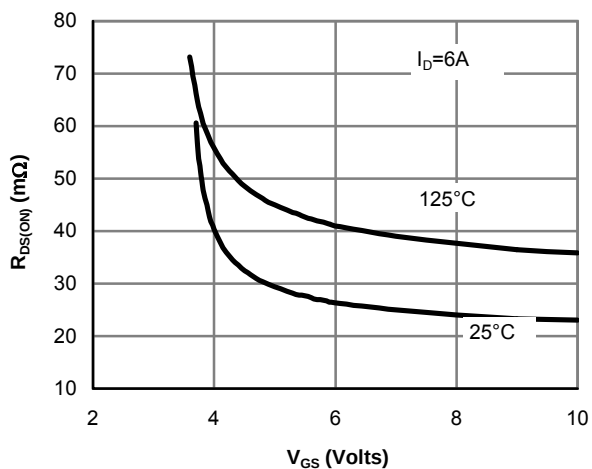


Figure 5: On-Resistance vs. Gate-Source Voltage

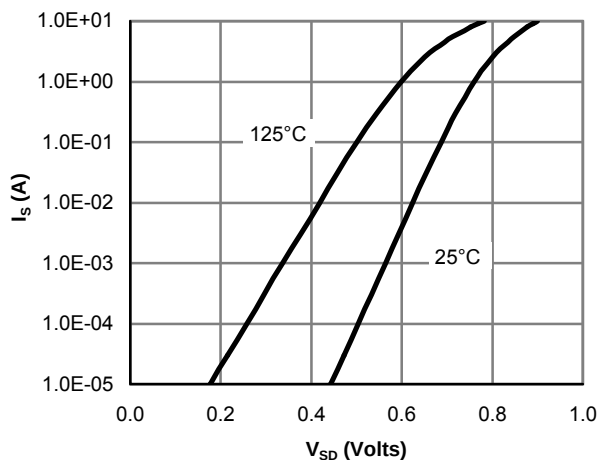


Figure 6: Body-Diode Characteristics

P-Channel Electrical Characteristics (T_j = 25°C unless otherwise specified) P 沟道电气特性 25°C

Parameter 参数	符号	Test Condition 测试条件	最小值	典型值	最大值	单位
Static 静态参数						
Drain-Source Breakdown Voltage 漏源击穿电压	BV_{DSS}	$V_{GS} = 0V, I_D = -250\mu A$	-40			V
Drain-Source On-State Resistance 漏源导通电阻	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -4.0A$		51	63	mΩ
Drain-Source On-State Resistance 漏源导通电阻	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -5.0A$		35	45	
Gate Threshold Voltage 栅源电压	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-1.7	-3	V
Zero Gate Voltage Drain Current 0 栅压漏极电流	I_{DSS}	$V_{DS} = -40V, V_{GS} = 0V$			-1	uA
Gate Body Leakage 漏极短路时截止栅电流	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
Forward Transconductance 正向跨导	g_{fs}	$V_{DS} = -5V, I_D = -5A$		5		S
Dynamic ³⁾ 动态参数						
Total Gate Charge 栅极总电荷	Q_g	$V_{DS} = -20V, I_D = -1.5A$ $V_{GS} = -10V$		21.52		nC
Gate-Source Charge 栅-源极电荷	Q_{gs}			2.4		
Gate-Drain Charge 栅-漏极电荷	Q_{gd}			4.82		
Turn-On Delay Time 导通延迟时间	$t_{d(on)}$	$V_{DD} = -20V, R_L = 5\Omega$ $I_D = -1A, V_{GEN} = -10V$ $R_G = 3\Omega$		15.08		ns
Turn-On Rise Time 导通上升时间	t_r			14.53		
Turn-Off Delay Time 关断延迟时间	$t_{d(off)}$			51		
Turn-Off Fall Time 关断下降时间	t_f			14.8		
Input Capacitance 输入电容	C_{iss}	$V_{DS} = -20V, V_{GS} = 0V$ $f = 1.0MHz$		1238		pF
Output Capacitance 输出电容	C_{oss}			99		
Reverse Transfer Capacitance 反向传输电容	C_{rss}			67.5		
Source-Drain Diode 源漏二极管参数						
Max. Diode Forward Current 最大正向电流	I_S				-2.3	A
Diode Forward Voltage 正向电压	V_{SD}	$I_S = -2.3A, V_{GS} = 0V$			-1.2	V

P-Channel

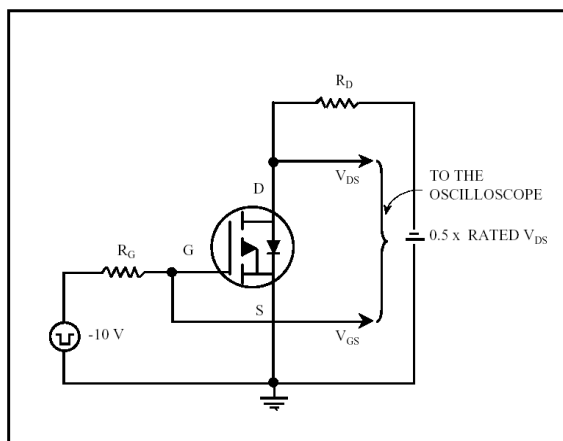


Fig 13. Switching Time Circuit

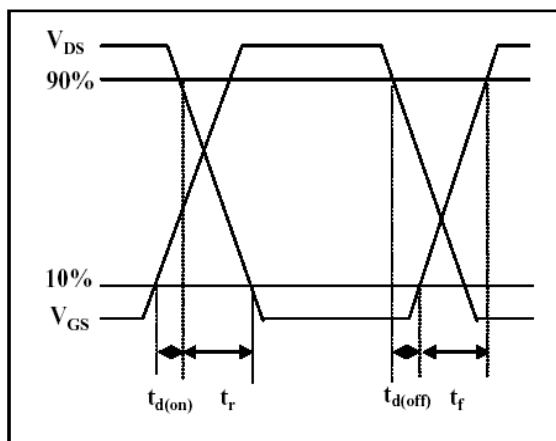


Fig 14. Switching Time Waveform

P-Channel Characteristics Curve P 沟道电气性能特征曲线

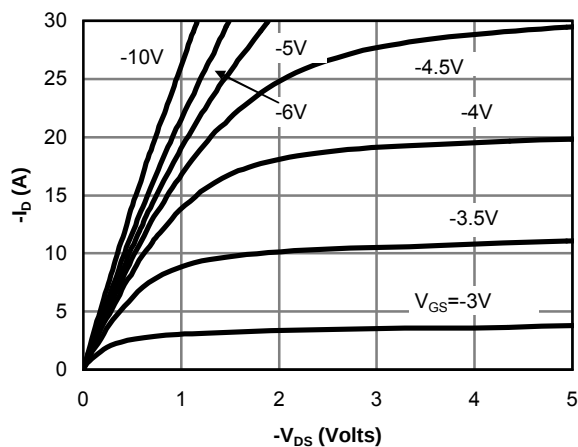


Figure 1: On-Region Characteristics

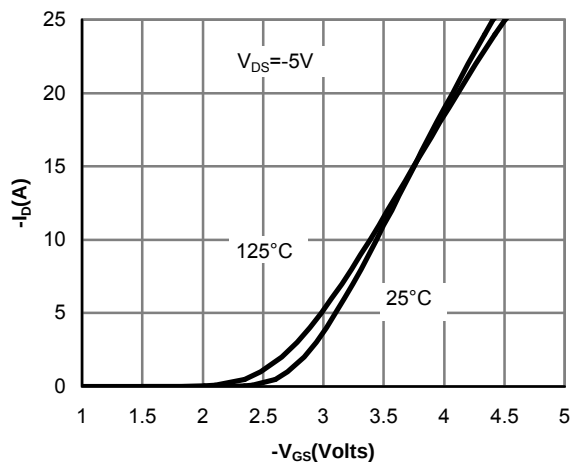


Figure 2: Transfer Characteristics

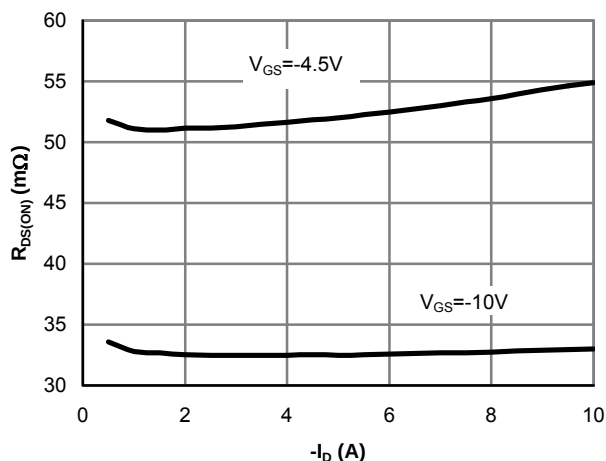


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

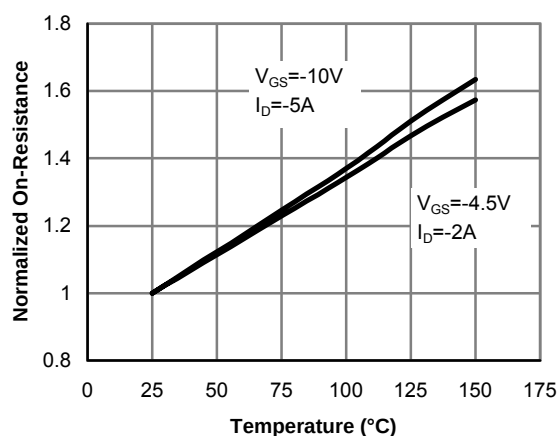


Figure 4: On-Resistance vs. Junction Temperature

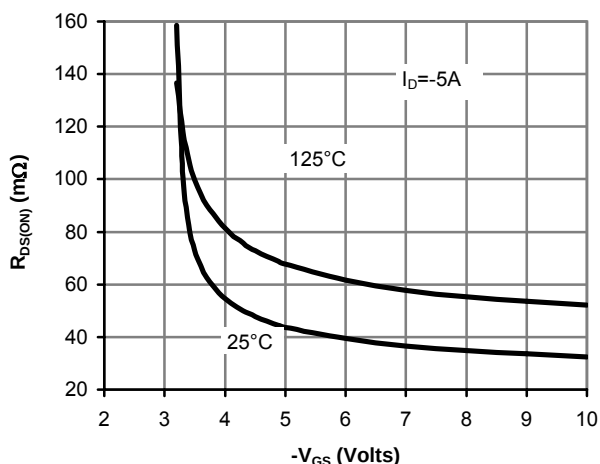


Figure 5: On-Resistance vs. Gate-Source Voltage

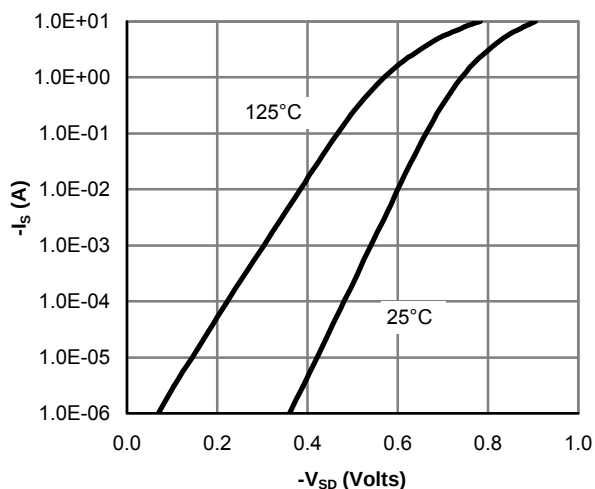


Figure 6: Body-Diode Characteristics