

YGMOS Technology Corp.

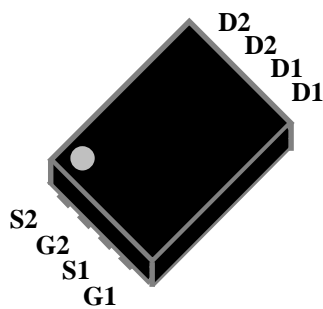
40V N and P-CHANNEL ENHANCEMENT MODE POWER MOSFET 40V N + P 沟道增强型 MOS 管

N-Channel $V_{DS}= 40V$
 $R_{DS(ON)}, V_{GS}@10V, I_{ds}@8.8A = 26.5m\Omega$
 $R_{DS(ON)}, V_{GS}@4.5V, I_{ds}@5.0A = 45.0m\Omega$
P-Channel $V_{DS}= - 40V$
 $R_{DS(ON)}, V_{GS}@-10V, I_{ds}@- 7.3A = 42.0m\Omega$
 $R_{DS(ON)}, V_{GS}@- 4.5V, I_{ds}@- 4.9A =70.0m\Omega$
Features 特性

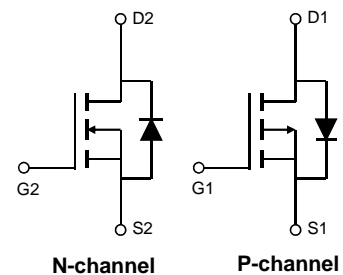
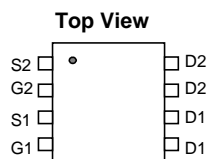
Advanced trench process technology 高级的加工技术

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

Package Dimensions 外形图



PDFN5*6


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

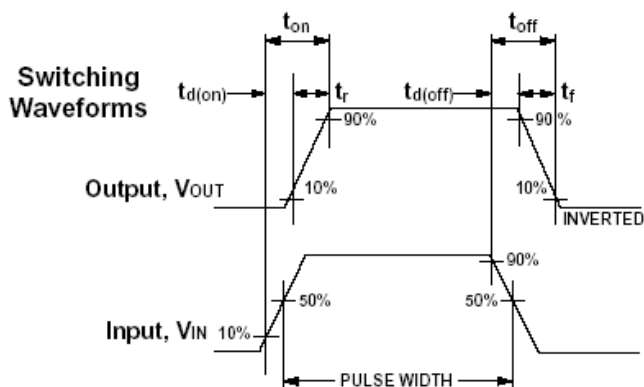
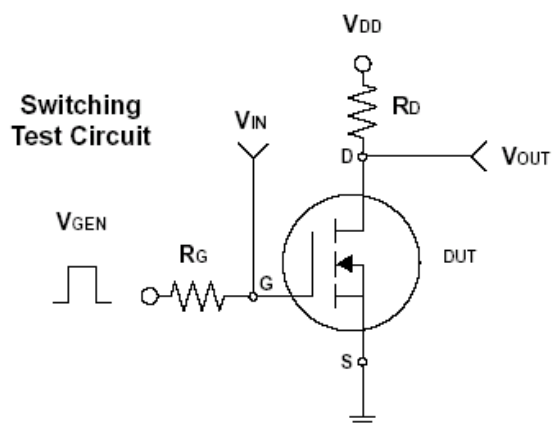
Parameter 极限参数	Symbol 符号	Ratings 等级		Unit 单位
		N-沟道	P-沟道	
Drain-Source Voltage 漏源电压	V_{DS}	40	-40	V
Gate-Source Voltage 栅源电压	V_{GS}	± 20	± 20	V
Continuous Drain Current 连续漏极电流	I_D	8.8	-7.3	A
Pulsed Drain Current 脉冲漏极电流	I_{DM}	30	-30	A
Total Power Dissipation 功耗	$P_D @TA=25^\circ C$	3.1	3.2	W
Total Power Dissipation 功耗	$P_D @TA=75^\circ C$	2.0	2.1	W
Operating Junction and Storage Temperature Range 使用及储存温度	T_J, T_{stg}	-55 ~ +150		$^\circ C$
Junction-to-Ambient Thermal Resistance (PCB mounted) 结环热阻	T_j, T_{stg}	62.5		W/ $^\circ C$

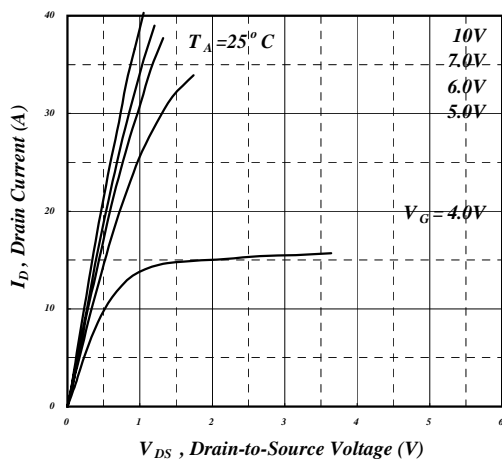
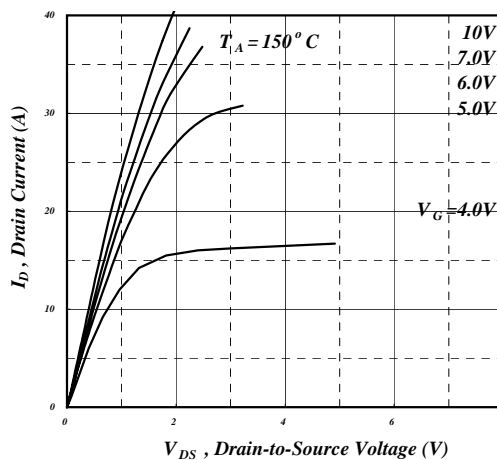
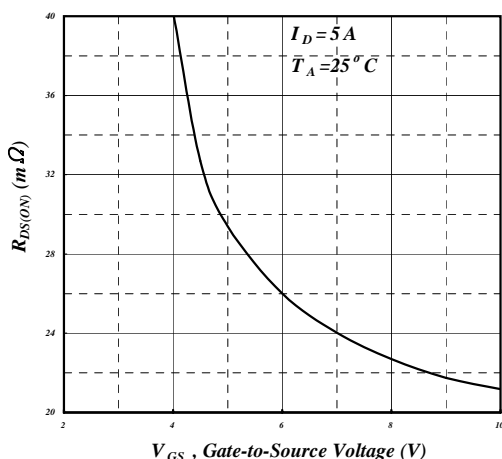
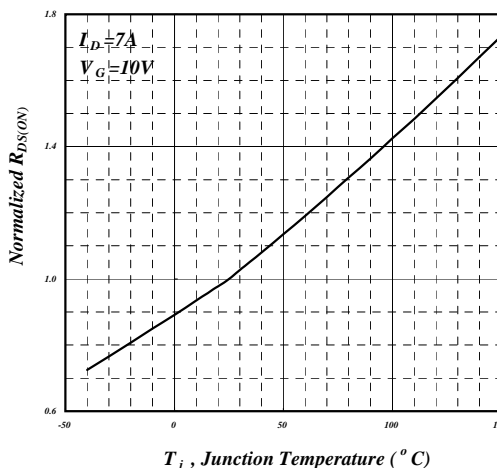
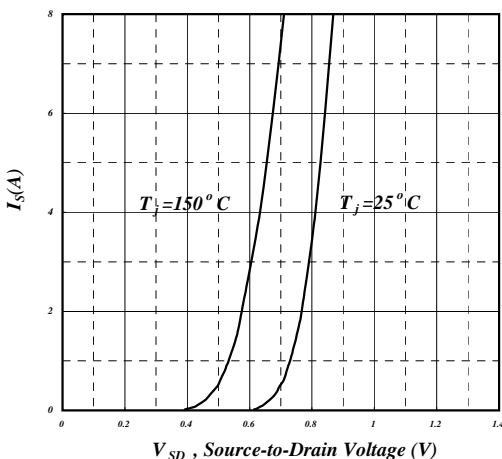
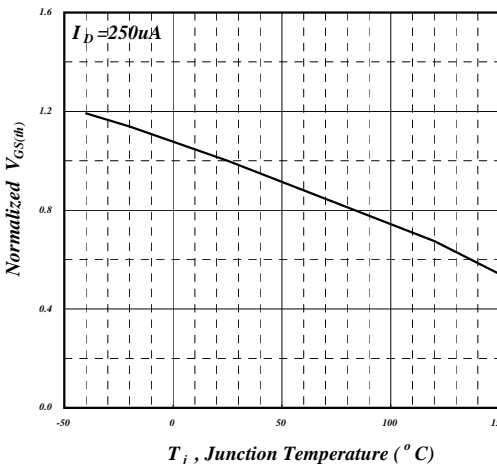
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 N-Channel Electrical Characteristics ($T_j = 25^\circ\text{C}$ unless otherwise specified)

 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}	$V_{GS} = 0V, I_D = 250\mu A$	40			V
Drain-Source On-State Resistance 漏源导通电阻	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 5.0A$		30	45	m Ω
Drain-Source On-State Resistance 漏源导通电阻	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 7.0A$		21	26.5	
Gate Threshold Voltage 开启电压	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.65	3	V
Zero Gate Voltage Drain Current 零栅压漏极电流	I_{DSS}	$V_{DS} = 32V, V_{GS} = 0V$			10	μA
Gate Body Leakage 漏极短路时截止栅电流	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 30	nA
Gate Resistance 栅极电阻	R_g	$V_{DS} = 0V, V_{GS} = 0V$ at 1.0MHz		2.2	4.4	Ω
Forward Transconductance 正向跨导	g_{fs}	$V_{DS} = 15V, I_D = 6A$		15		S
Dynamic 动态参数						
Total Gate Charge 栅极总电荷	Q_g	$V_{DS} = 20V, I_D = 8A$ $V_{GS} = 10V$		15		nC
Gate-Source Charge 栅-源极电荷	Q_{gs}			1.4		
Gate-Drain Charge 栅-漏极电荷	Q_{gd}			3.7		
Turn-On Delay Time 导通延迟时间	$t_{d(on)}$	$V_{DS} = 20V, R_L = 10\Omega$ $I_D = 1A, V_{GS} = 10V$ $R_G = 3.0\Omega$		10		ns
Turn-On Rise Time 导通上升时间	t_r			5.1		
Turn-Off Delay Time 关断延迟时间	$t_{d(off)}$			37.8		
Turn-Off Fall Time 关断下降时间	t_f			5.6		
Input Capacitance 输入电容	C_{iss}	$V_{DS} = 20V, V_{GS} = 0V$ $f = 1.0MHz$		748		pF
Output Capacitance 输出电容	C_{oss}			65.5		
Reverse Transfer Capacitance 反向传输电容	C_{rss}			52		
Source-Drain Diode 源漏二极管参数						
Max. Diode Forward Current 最大正向电流	I_S				8	A
Diode Forward Voltage 正向电压	V_{SD}	$I_S = 1.0A, V_{GS} = 0V$			1	V

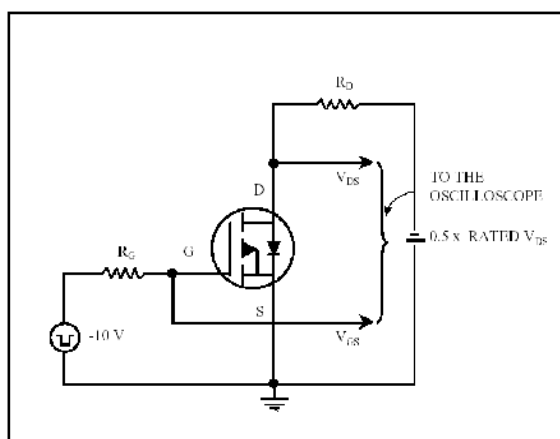
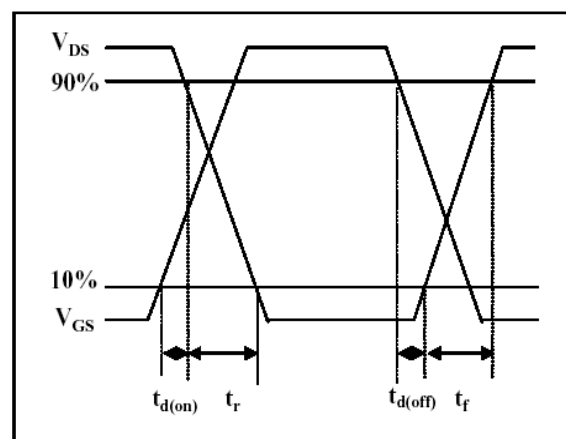
 Note: Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$ 注意: 脉冲测试: 脉冲宽度 $\leq 300\mu s$ 死区 $\leq 2\%$


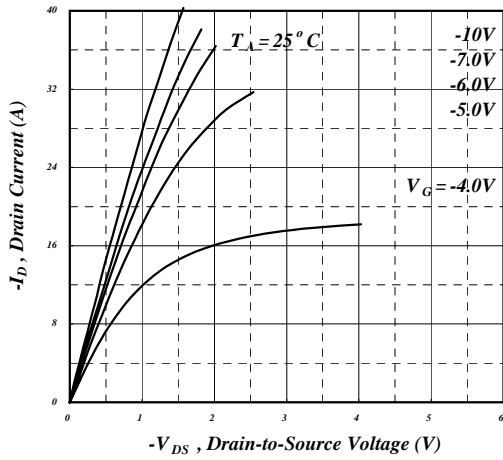
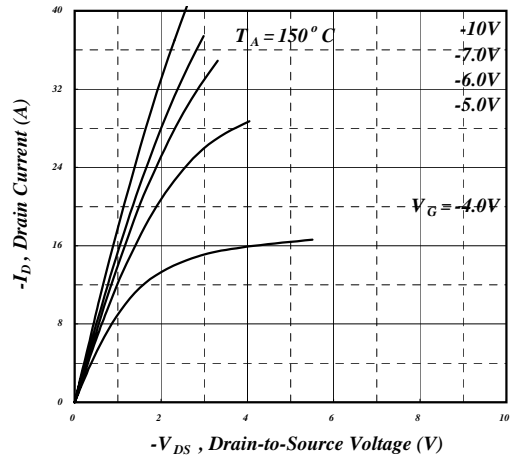
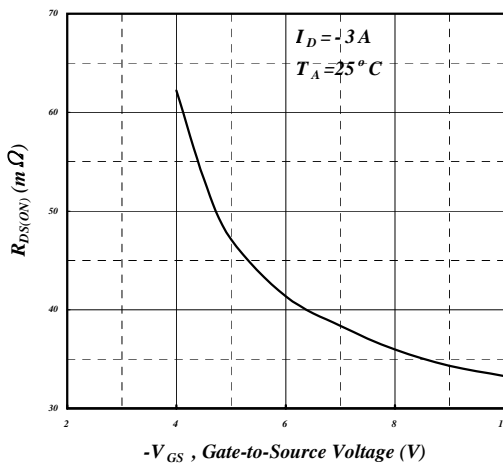
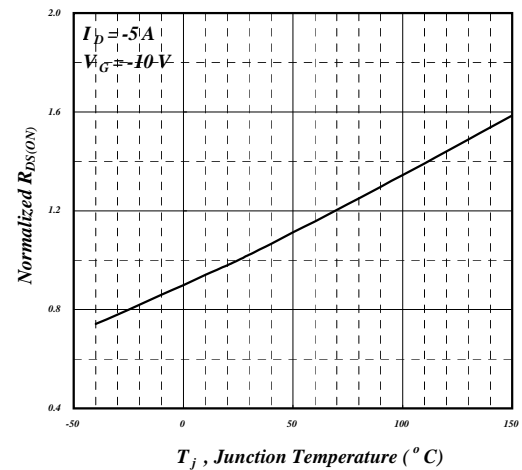
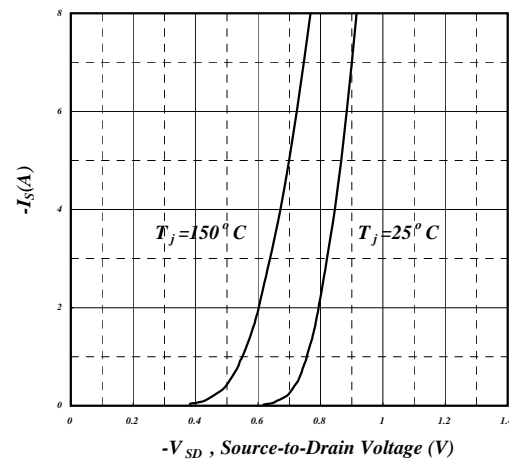
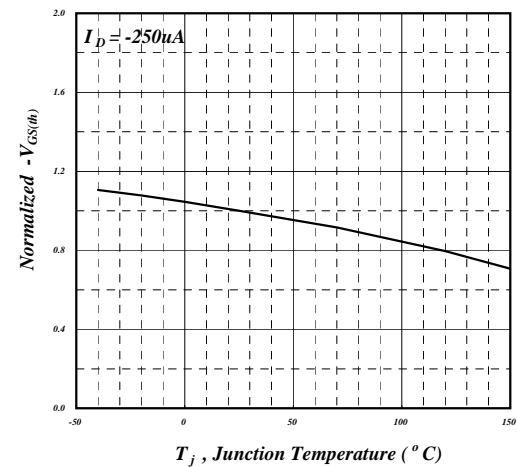
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N-Channel Characteristics Curve N 沟道电气性能特征曲线

Fig 1. Typical Output Characteristics

Fig 2. Typical Output Characteristics

Fig 3. On-Resistance v.s. Gate Voltage

Fig 4. Normalized On-Resistance v.s. Junction Temperature

Fig 5. Forward Characteristic of Reverse Diode

Fig 6. Gate Threshold Voltage v.s. Junction Temperature

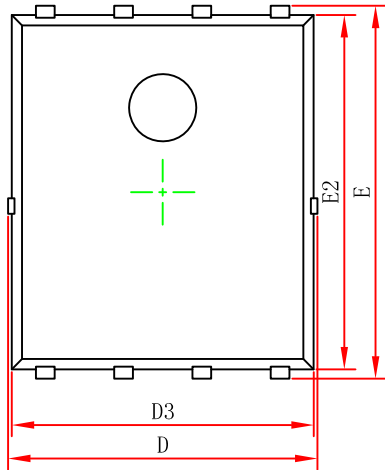
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 P-Channel Electrical Characteristics ($T_j = 25^\circ\text{C}$ unless otherwise specified) P 沟道电气特性 25°C

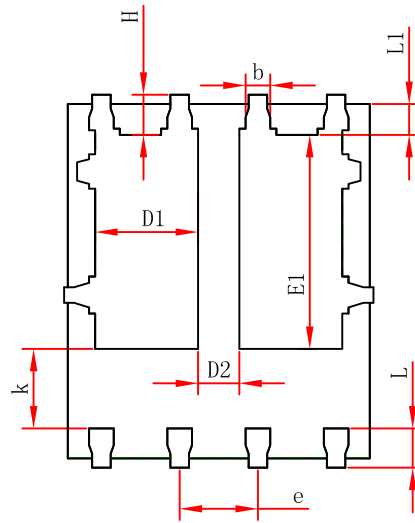
Parameter 参数	符号	Test Condition 测试条件	最小值	典型值	最大值	单位
Static 静态参数						
Drain-Source Breakdown Voltage 漏源击穿电压	BV_{DSS}	$V_{GS} = 0V, I_D = -250\mu A$	-40			V
Drain-Source On-State Resistance 漏源导通电阻	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -3.0A$		50	70	m Ω
Drain-Source On-State Resistance 漏源导通电阻	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -5.0A$		38	42	
Gate Threshold Voltage 栅源电压	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-1.65	-3	V
Zero Gate Voltage Drain Current 零栅压漏极电流	I_{DSS}	$V_{DS} = -32V, V_{GS} = 0V$			-10	μA
Gate Body Leakage 漏极短路时截止栅电流	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 30	nA
Gate Resistance 栅极电阻	R_g	$V_{GS}=0V, V_{DS}=0V, f=1MHz$		6.5	12	Ω
Forward Transconductance 正向跨导	g_{fs}	$V_{DS} = -15V, I_D = -6A$		12		S
Dynamic 动态参数						
Total Gate Charge 栅极总电荷	Q_g	$V_{DS} = -20V, I_D = -8A$ $V_{GS} = -10V$		21.8		nC
Gate-Source Charge 栅-源极电荷	Q_{gs}			2.4		
Gate-Drain Charge 栅-漏极电荷	Q_{gd}			5.0		
Turn-On Delay Time 导通延迟时间	$t_{d(on)}$	$V_{DS} = -20V, R_L = 10\Omega$ $I_D = -5A, V_{GS} = -10V$ $R_G = 3.0\Omega$		14.9		ns
Turn-On Rise Time 导通上升时间	t_r			6.7		
Turn-Off Delay Time 关断延迟时间	$t_{d(off)}$			45.4		
Turn-Off Fall Time 关断下降时间	t_f			9.8		
Input Capacitance 输入电容	C_{iss}	$V_{DS} = -20V, V_{GS} = 0V$ $f = 1.0MHz$		1233		pF
Output Capacitance 输出电容	C_{oss}			98		
Reverse Transfer Capacitance 反向传输电容	C_{rss}			68		
Source-Drain Diode 源漏二极管参数						
Max. Diode Forward Current 最大正向电流	I_S				-8	A
Diode Forward Voltage 正向电压	V_{SD}	$I_S = -1.0A, V_{GS} = 0V$			-1	V

P-Channel

Fig 13. Switching Time Circuit

Fig 14. Switching Time Waveform

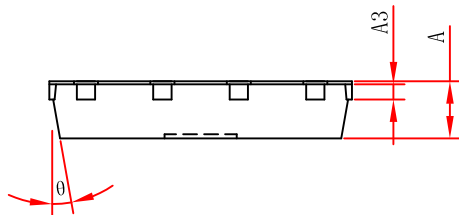
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Fig 6. Gate Threshold Voltage v.s. Junction Temperature

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Package PDFN5*6 Information


Top View
[顶视图]



Bottom View
[背视图]



Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254 REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	1.470	1.870	0.058	0.074
D2	0.470	0.870	0.019	0.034
E1	3.375	3.575	0.133	0.141
D3	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°