

N-channel Enhancement Mode MOSFET

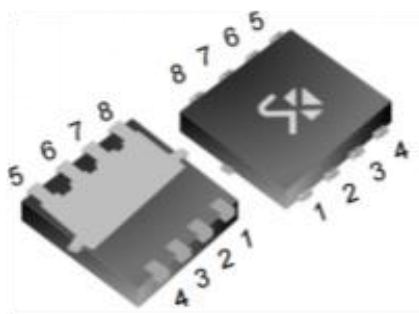
Features

- Low gate charge
- Low reverse transmission capacitance
- Fast switching speed
- Improved dv / dt capability

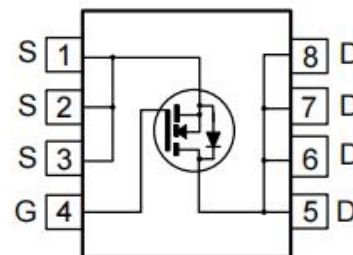
Applications

- Load Switch
- Uninterrupted Power Supply
- Inverter system
- Power management field

$BV_{DSS}, T_A=25^{\circ}C$	$I_D, T_A=25^{\circ}C$	$R_{DS(on)}, typ@10V$
30 V	45A	8.5mΩ



PDFN3.3*3.3



Descriptions

N-channel enhanced power MOS field effect transistors are fabricated by LVMOS process technology. Advanced technology and cell structure make the product have low conduction resistance, superior switching performance and high avalanche breakdown tolerance.

Ordering Information

Orderable Part Number	Package Type	Form	Print Name	Environmental Protection Level	Packaging method
	PDFN3.3*3.3	Tape & Reel		Halogen-free	Tape feeder

Absolute Maximum Ratings($T_A=25^{\circ}C$)

Parameter		Symbol	Value	Unit
Drain-source Voltage		V_{DS}	30	V
Gate-source Voltage		V_{GS}	± 20	V
Drain Current-Continuous	$T_C=25^{\circ}C$	I_D	45	A
	$T_C=100^{\circ}C$		29	A
Drain Current	Pulsed	I_{DM}	180	A
Power Dissipation	$T_C=25^{\circ}C$	P_D	32	W
	Greater than $25^{\circ}C$, reduce by each degree Celsius		0.26	W/ $^{\circ}C$
Avalanche energy, single pulse ⁽¹⁾		E_{AS}	85	mJ

Operating Junction Temperature Range	T_J	-55~150	°C
Storage Temperature Range	T_{STG}	-55~150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction to Case, Max.	$R_{\theta JC}$	3.9	°C/W
Thermal Resistance, Junction to Ambient, Max.	$R_{\theta JA}$	4.5	°C/W

Electrical Characteristics($T_J=25^{\circ}\text{C}$)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-source Breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V			1	μA
Gate-source leakage current	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			+100	nA
		V _{GS} =-20V, V _{DS} =0V			-100	nA
On Characteristics						
Gate Threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0		3.0	V
Static Drain to Source on resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 15A		8.5	10	m Ω
		V _{GS} = 4.5V, I _D = 15A		12	15	
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =30V,V _{GS} =0V, f=1MHz		1208		pF
Output Capacitance	C _{oss}			145		pF
Reverse Capacitance	C _{rss}			117		pF
Total Gate Charge ^(2,3)	Q _g	V _{DD} = 24V, I _D = 15A, V _{GS} = 10V		26		nC
Gate to Source Charge ^(2,3)	Q _{gs}			5.0		nC
Gate to Drain “Miller” Charge ^(2,3)	Q _{gd}			5.5		nC
Internal Gate Resistance	R _G	f=1MHz, V _{DS} =0V ,V _{GS} =0V		5.2		Ω

Switching Characteristics						
Turn-On Delay Time ^(2,3)	t _{d(on)}	V _{GS} = 10V, V _{DD} = 20V, R _G = 6Ω, I _D = 15A		4.7		nS
Turn-On Rise Time ^(2,3)	t _r			34		nS
Turn-Off Delay Time ^(2,3)	t _{d(off)}			40		nS
Turn-Off Fall Time ^(2,3)	t _f			16		nS
Source-Drain Diode Characteristics						
Continuous Source Current	I _S	V _G = V _D = 0V,Force Current			45	A
Pulsed Source Current	I _{SM}				180	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =15A			1.4	V
Reverse Recovery Time ⁽²⁾	t _{rr}	I _{SD} =15A,V _{GS} =0V dI _F /dt=100A/μs		13		ns
Reverse Recovery Charge ⁽²⁾	Q _{rr}			0.005		nC

Note:

(1) $L=0.5mH, V_{DD} = 15 V, V_G = 10 V, R_G = 25$, the start temperature $T_J = 25 ^\circ C$.

(2)Pulse test: pulse width $\leq 300 \mu s$, duty cycle $\leq 2\%$.

(3)Basically is unaffected by the operating temperature.

Typical Characteristics

图 1. 输出特性

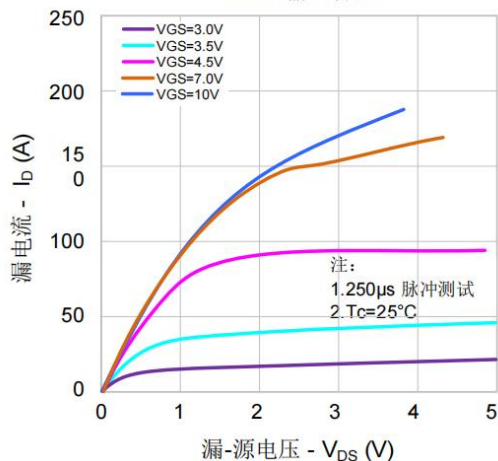


图 2. 传输特性

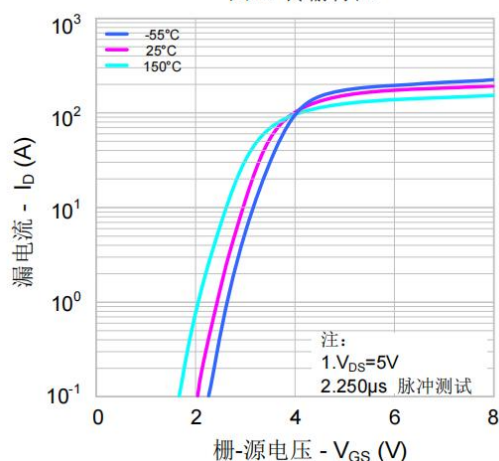


图 3. 导通电阻 vs. 漏电流

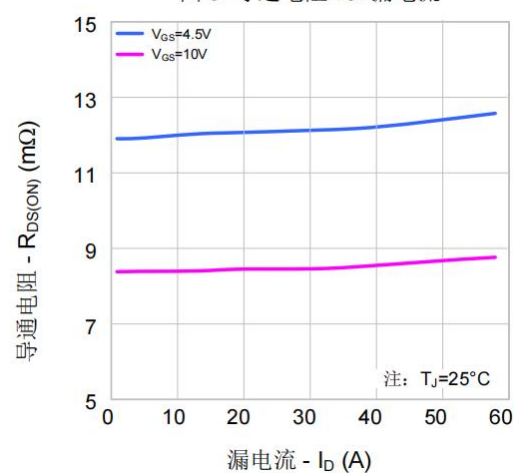


图 4. 体二极管正向压降 vs. 源电流和温度

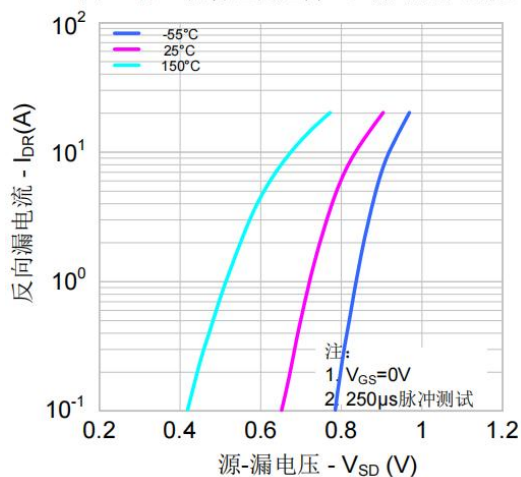


图 5. 电容特性

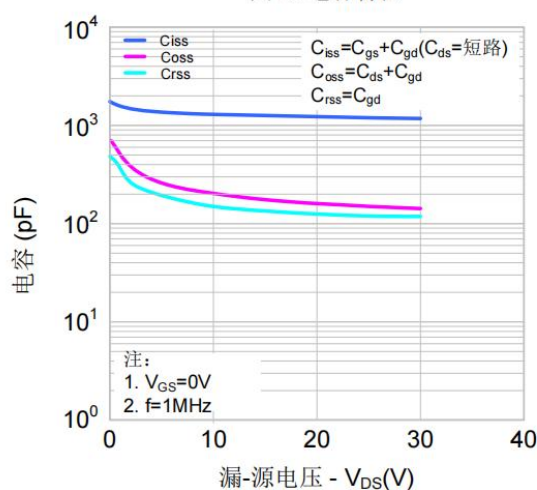


图 6. 栅极电荷特性

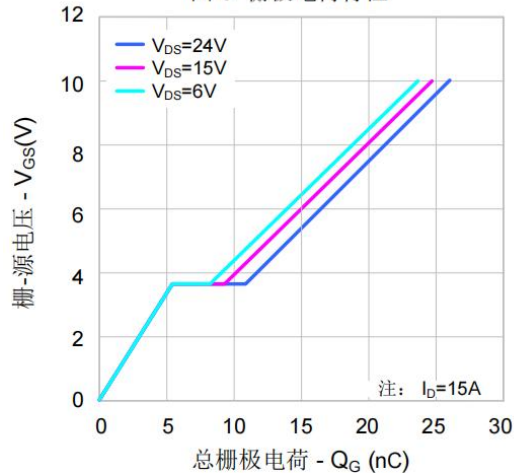


图 7. 击穿电压 vs. 温度特性

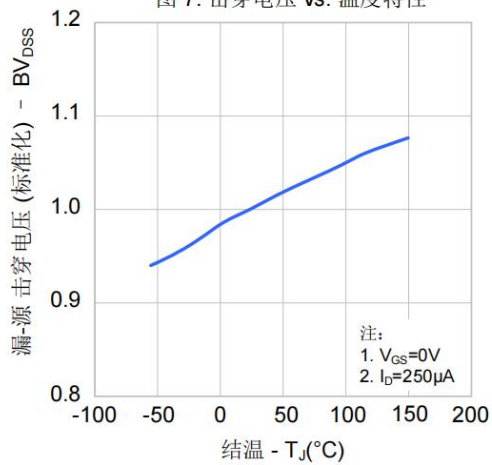


图 8. 导通电阻 vs. 温度特性

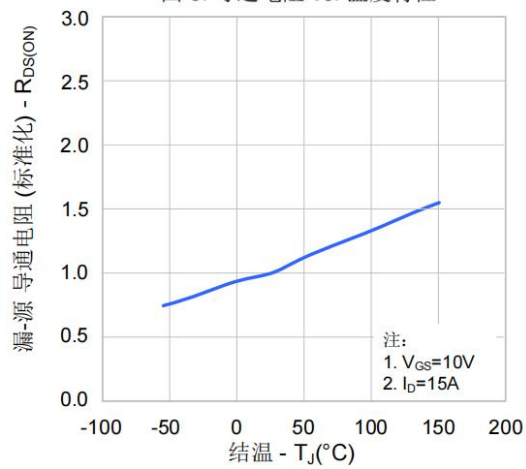
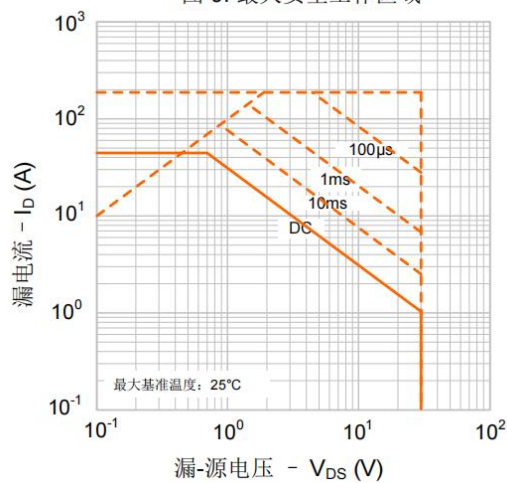
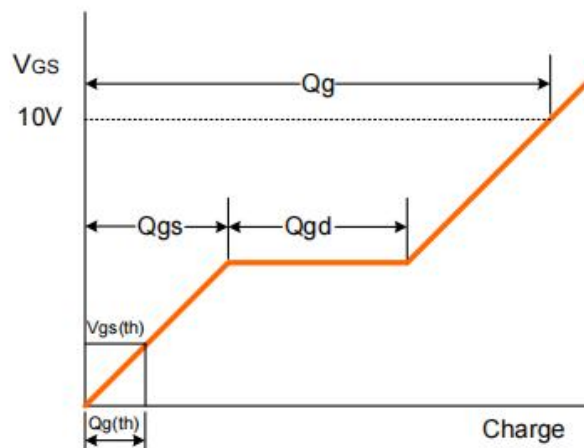
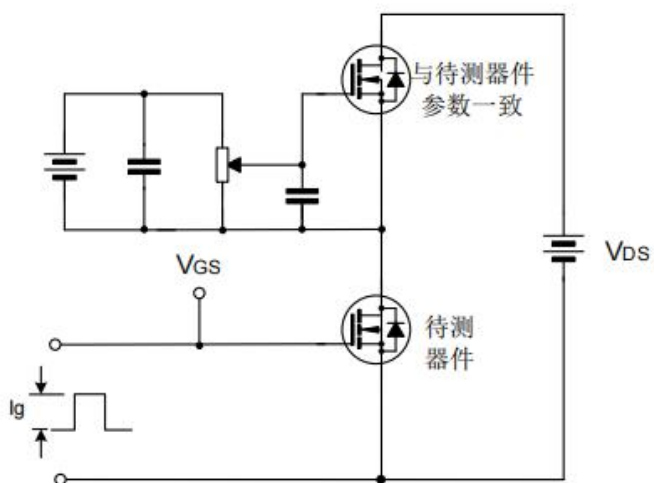


图 9. 最大安全工作区域

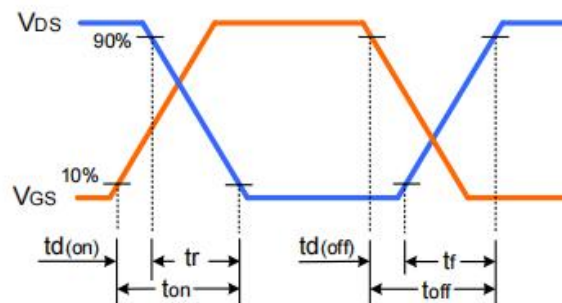
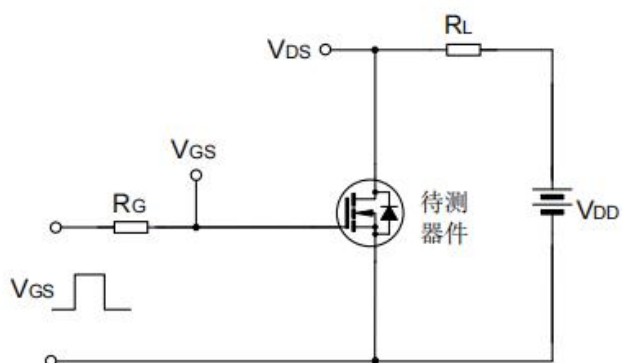


Typical test circuit

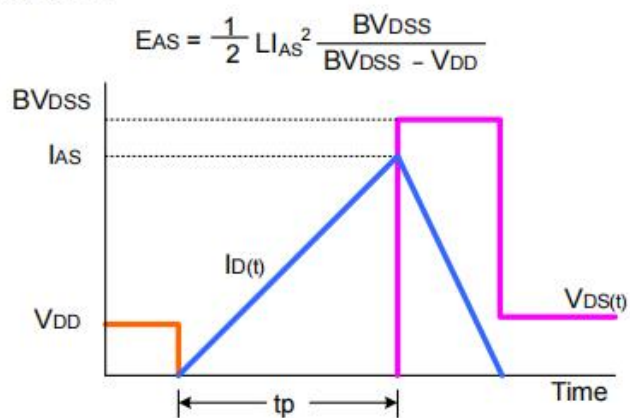
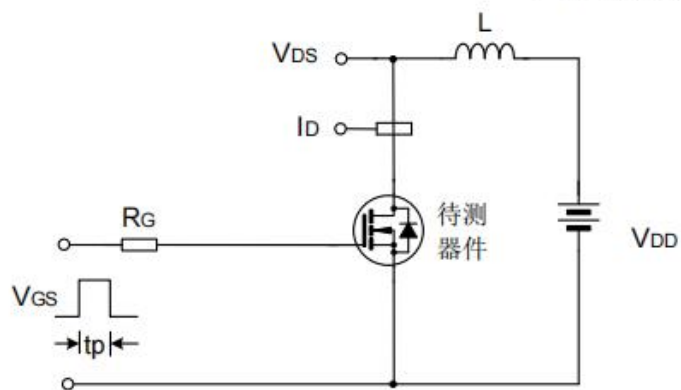
栅极电荷量测试电路及波形图



开关时间测试电路及波形图



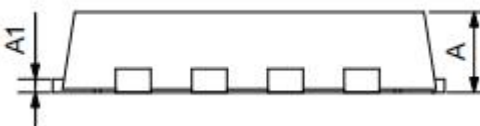
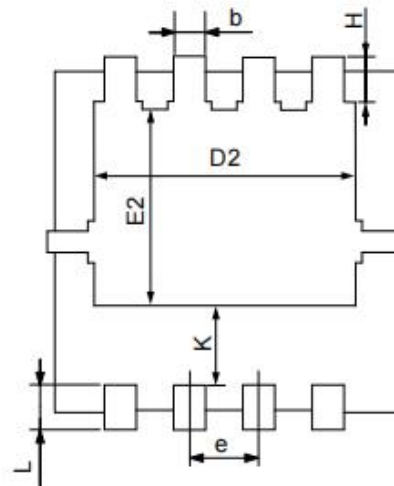
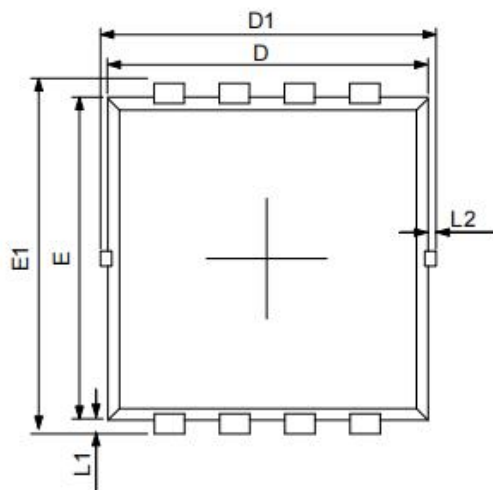
EAS测试电路及波形图



Package Information

PDFN 3.3x3.3

Dimensions in mm



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.70	0.80	0.90
A1	0.14	0.15	0.20
b	0.25	0.30	0.35
D	3.05	3.15	3.25
D1	3.10	3.30	3.50
D2	2.35	2.45	2.55
E	2.90	3.00	3.10
E1	3.10	3.30	3.50
E2	1.64	1.74	1.84
e	0.55	0.65	0.75
H	0.32	0.42	0.52
K	0.59	0.69	0.79
L	0.25	0.40	0.55
L1	0.10	0.15	0.20
L2	—	—	0.15