



**Yixin Advanced Power MOSFET**

**SSH10N60A**

## FEATURES

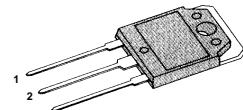
- Avalanche Rugged Technology
- Rugged Gate Oxide Technology
- Lower Input Capacitance
- Improved Gate Charge
- Extended Safe Operating Area
- Lower Leakage Current : 25  $\mu$ A (Max.) @  $V_{DS} = 600V$
- Low  $R_{DS(ON)}$  : 0.646  $\Omega$  (Typ.)

$BV_{DSS} = 600 V$

$R_{DS(on)} = 0.8 \Omega$

$I_D = 10 A$

**TO-3P**



1.Gate 2. Drain 3. Source

## Absolute Maximum Ratings

Symbol	Characteristic	Value	Units
$V_{DSS}$	Drain-to-Source Voltage	600	V
$I_D$	Continuous Drain Current ( $T_C=25^\circ C$ )	10	A
	Continuous Drain Current ( $T_C=100^\circ C$ )	6.3	
$I_{DM}$	Drain Current-Pulsed	40	A
$V_{GS}$	Gate-to-Source Voltage	$\pm 30$	V
$E_{AS}$	Single Pulsed Avalanche Energy	545	mJ
$I_{AR}$	Avalanche Current	10	A
$E_{AR}$	Repetitive Avalanche Energy	19.3	mJ
$dv/dt$	Peak Diode Recovery $dv/dt$	3.0	V/ns
$P_D$	Total Power Dissipation ( $T_C=25^\circ C$ )	193	W
	Linear Derating Factor	1.54	$W/\text{ }^\circ C$
$T_J, T_{STG}$	Operating Junction and Storage Temperature Range	- 55 to +150	$^\circ C$
	Maximum Lead Temp. for Soldering Purposes, 1/8 " from case for 5-seconds	300	

## Thermal Resistance

Symbol	Characteristic	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	--	0.65	$^\circ C / W$
$R_{\theta CS}$	Case-to-Sink	0.24	--	
$R_{\theta JA}$	Junction-to-Ambient	--	40	

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## Electrical Characteristics ( $T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
$\text{BV}_{\text{DSS}}$	Drain-Source Breakdown Voltage	600	--	--	V	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_D=250\mu\text{A}$
$\Delta \text{BV}/\Delta T_J$	Breakdown Voltage Temp. Coeff.	--	0.66	--	$\text{V}/^\circ\text{C}$	$\text{I}_D=250\mu\text{A}$ See Fig 7
$\text{V}_{\text{GS(th)}}$	Gate Threshold Voltage	2.0	--	4.0	V	$\text{V}_{\text{DS}}=5\text{V}, \text{I}_D=250\mu\text{A}$
$\text{I}_{\text{GSS}}$	Gate-Source Leakage , Forward	--	--	100	nA	$\text{V}_{\text{GS}}=30\text{V}$
	Gate-Source Leakage , Reverse	--	--	-100		$\text{V}_{\text{GS}}=-30\text{V}$
$\text{I}_{\text{DSS}}$	Drain-to-Source Leakage Current	--	--	25	$\mu\text{A}$	$\text{V}_{\text{DS}}=600\text{V}$
		--	--	250		$\text{V}_{\text{DS}}=480\text{V}, \text{T}_C=125^\circ\text{C}$
$\text{R}_{\text{DS(on)}}$	Static Drain-Source On-State Resistance	--	--	0.8	$\Omega$	$\text{V}_{\text{GS}}=10\text{V}, \text{I}_D=5\text{A}$ ④
$\text{g}_{\text{fs}}$	Forward Transconductance	--	8.5	--	$\Omega$	$\text{V}_{\text{DS}}=50\text{V}, \text{I}_D=5\text{A}$ ④
$\text{C}_{\text{iss}}$	Input Capacitance	--	1750	2270	pF	$\text{V}_{\text{GS}}=0\text{V}, \text{V}_{\text{DS}}=25\text{V}, f=1\text{MHz}$ See Fig 5
$\text{C}_{\text{oss}}$	Output Capacitance	--	190	220		
$\text{C}_{\text{rss}}$	Reverse Transfer Capacitance	--	78	90		
$t_{\text{d(on)}}$	Turn-On Delay Time	--	20	50	ns	$\text{V}_{\text{DD}}=300\text{V}, \text{I}_D=10\text{A}, \text{R}_G=6.2\Omega$ See Fig 13 ④⑤
$t_r$	Rise Time	--	23	55		
$t_{\text{d(off)}}$	Turn-Off Delay Time	--	85	180		
$t_f$	Fall Time	--	30	70		
$\text{Q}_g$	Total Gate Charge	--	74	95	nC	$\text{V}_{\text{DS}}=480\text{V}, \text{V}_{\text{GS}}=10\text{V}, \text{I}_D=10\text{A}$ See Fig 6 & Fig 12 ④⑤
$\text{Q}_{\text{gs}}$	Gate-Source Charge	--	12	--		
$\text{Q}_{\text{gd}}$	Gate-Drain( "Miller" ) Charge	--	35.4	--		

## Source-Drain Diode Ratings and Characteristics

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
$\text{I}_S$	Continuous Source Current	--	--	10	A	Integral reverse pn-diode in the MOSFET
$\text{I}_{\text{SM}}$	Pulsed-Source Current ①	--	--	40		
$\text{V}_{\text{SD}}$	Diode Forward Voltage ④	--	--	1.4	V	$\text{T}_J=25^\circ\text{C}, \text{I}_S=10\text{A}, \text{V}_{\text{GS}}=0\text{V}$
$t_{\text{rr}}$	Reverse Recovery Time	--	440	--	ns	$\text{T}_J=25^\circ\text{C}, \text{I}_F=10\text{A}$ $d\text{I}/dt=100\text{A}/\mu\text{s}$ ④
$\text{Q}_{\text{rr}}$	Reverse Recovery Charge	--	4.7	--		

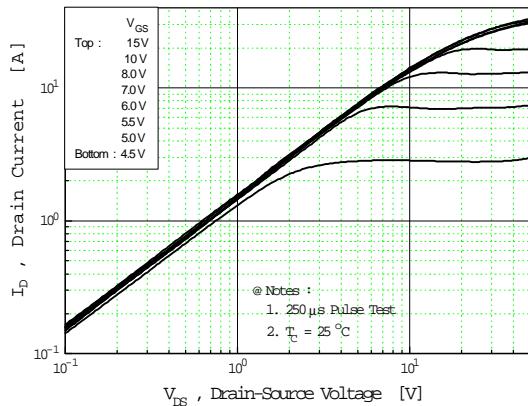
### Notes :

- ① Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature
- ②  $L=10\text{mH}, \text{I}_{\text{AS}}=10\text{A}, \text{V}_{\text{DD}}=50\text{V}, \text{R}_G=27\Omega$ , Starting  $\text{T}_J=25^\circ\text{C}$
- ③  $\text{I}_{\text{sp}} \leq 10\text{A}, d\text{I}/dt \leq 50\text{A}/\mu\text{s}, \text{V}_{\text{DD}} \leq \text{BV}_{\text{DSS}}$ , Starting  $\text{T}_J=25^\circ\text{C}$
- ④ Pulse Test : Pulse Width =  $250\mu\text{s}$ , Duty Cycle  $\leq 2\%$
- ⑤ Essentially Independent of Operating Temperature

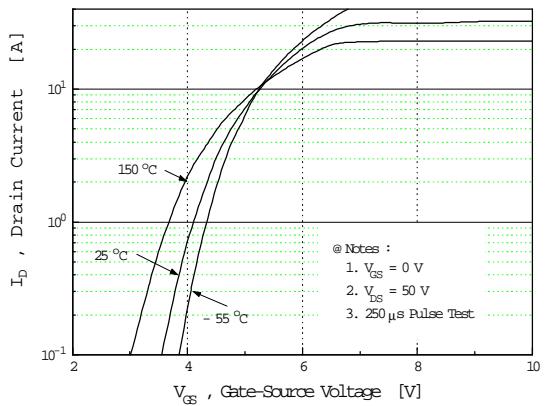
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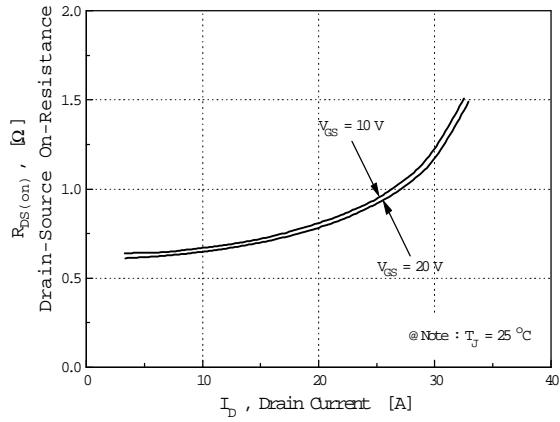
**Fig 1. Output Characteristics**



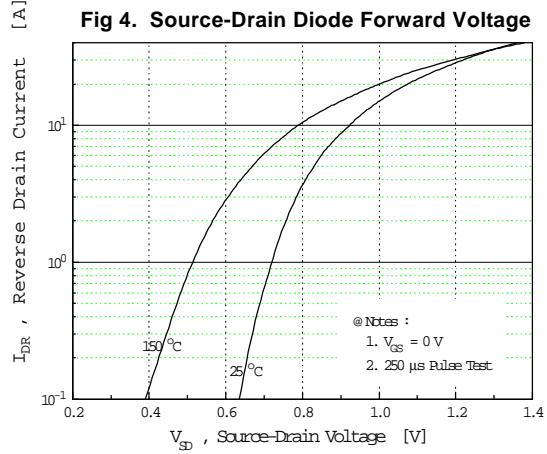
**Fig 2. Transfer Characteristics**



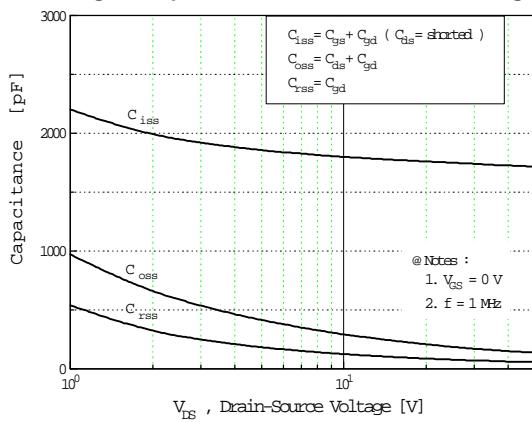
**Fig 3. On-Resistance vs. Drain Current**



**Fig 4. Source-Drain Diode Forward Voltage**



**Fig 5. Capacitance vs. Drain-Source Voltage**



**Fig 6. Gate Charge vs. Gate-Source Voltage**

