

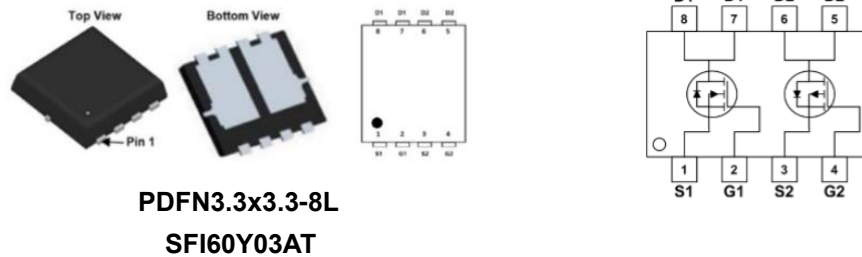
Features

- N Channel: 30V, 30A / P Channel: -30V, -29A
- N: $R_{DS(ON)} = 10m\Omega$ (Max.) @ $V_{GS} = 10V, I_D = 12A$
- P: $R_{DS(ON)} = 25m\Omega$ (Max.) @ $V_{GS} = -10V, I_D = -12A$
- Advanced trench cell design
- Lead Free Product is Acquired
- Surface Mount Package

Application

- MB and NB
- Motor drivers
- Half-bridge Drivers

Package



Absolute Maximum Ratings $T_C=25^\circ C$ unless otherwise specified

Symbol	Parameter	N-Channel	P-Channel	Units	
V_{DSS}	Drain-Source Voltage	30	-30	V	
V_{GSS}	Gate-Source Voltage	± 20	± 20	V	
I_D	Continuous Drain Current	$T_C = 25^\circ C$	30	-29	A
		$T_C = 100^\circ C$	22	-20	A
I_{DM}	Pulsed Drain Current ^{note1}	120	-116	A	
P_D	Power Dissipation	$T_C = 25^\circ C$ 21		W	
$R_{\theta JC}$	Thermal Resistance, Junction to Ambient	5.2		$^\circ C/W$	
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +175		$^\circ C$	

*Drain current limited by maximum junction temperature

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 30V, V_{GS} = 0V$	-	-	1	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	1.6	2.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance ^{note2}	$V_{GS} = 10V, I_D = 12A$	-	7	10	m Ω
		$V_{GS} = 4.5V, I_D = 10A$	-	9	13	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = 15V, V_{GS} = 0V,$ $f = 1.0MHz$	-	1317	-	pF
C_{oss}	Output Capacitance		-	163	-	pF
C_{rss}	Reverse Transfer Capacitance		-	131	-	pF
Q_g	Total Gate Charge (4.5V)	$V_{DS} = 20V, I_D = 12A,$ $V_{GS} = 4.5V$	-	13	-	nC
Q_{gs}	Gate-Source Charge		-	5	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	3.5	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS} = 12V, I_{DS} = 5A,$ $R_G = 3.3\Omega, V_{GS} = 4.5V$	-	5	-	ns
t_r	Turn-On Rise Time		-	11	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	25	-	ns
t_f	Turn-Off Fall Time		-	10	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Diode Forward Current		-	-	30	A
V_{SD} ^{note2}	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_{SD} = 1A$	-	-	1.3	V

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycles $\leq 2\%$

N-Channel Typical Performance Characteristics

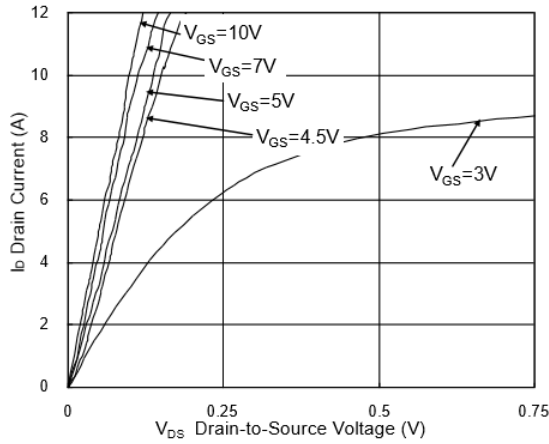


Figure 1. Output Characteristics

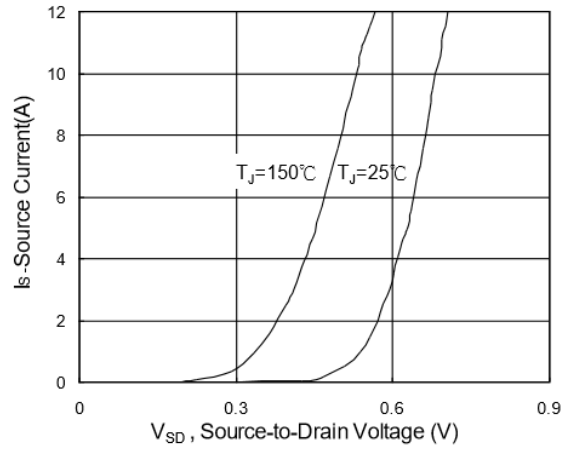


Figure 2. Forward Characteristics of Reverse

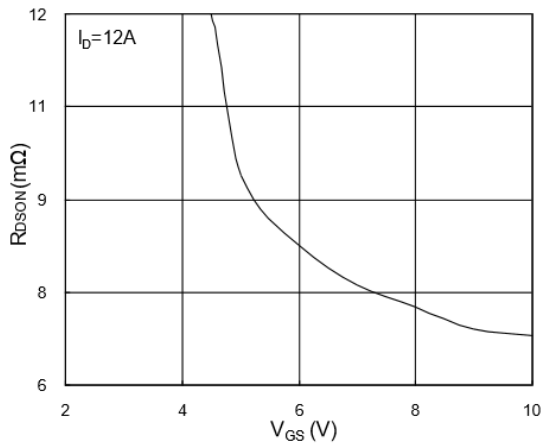


Figure 3. On-Resistance vs. Gate-Source

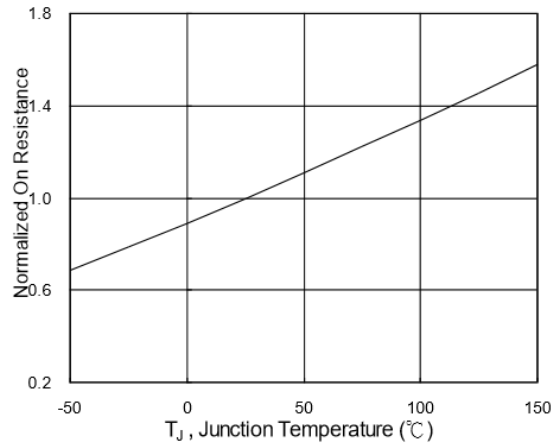


Figure 4. Drain-to-Source On Resistance

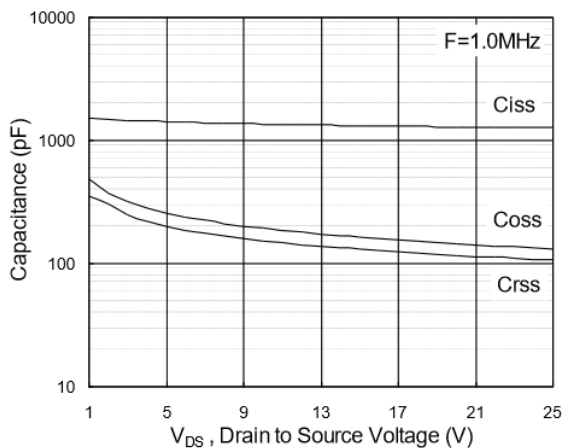


Figure 5. Capacitance Characteristics

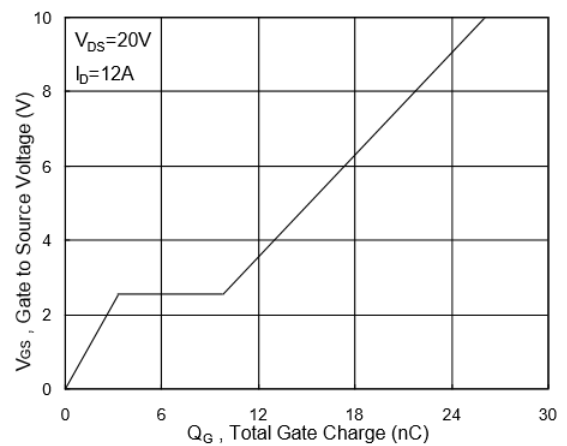


Figure 6. Gate Charge Characteristics

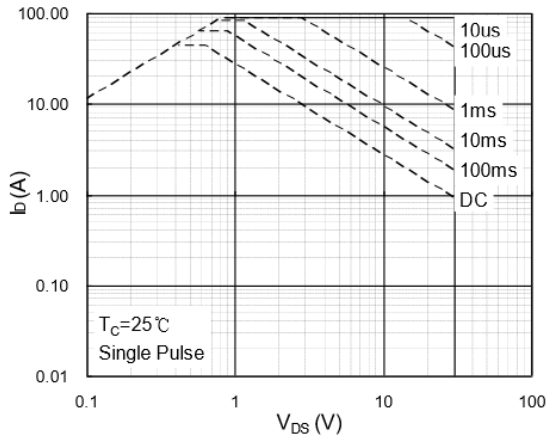


Figure 7. Maximum Safe Operating Area

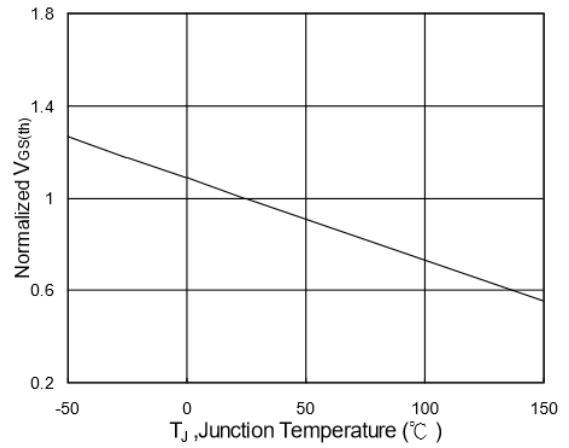


Figure 8. Normalized $V_{GS(th)}$ vs. T_J

P-Channel Electrical Characteristics $T_C=25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = -250\mu A$	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -30V, V_{GS} = 0V$	-	-	-1	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.0	-1.6	-2.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance ^{note2}	$V_{GS} = -10V, I_D = -12A$	-	19	25	m Ω
		$V_{GS} = -4.5V, I_D = -10A$	-	28	35	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = -15V, V_{GS} = 0V,$ $f = 1.0MHz$	-	1345	-	pF
C_{oss}	Output Capacitance		-	190	-	pF
C_{rss}	Reverse Transfer Capacitance		-	160	-	pF
Q_g	Total Gate Charge (-4.5V)	$V_{DS} = -15V, I_D = -15A,$ $V_{GS} = -4.5V$	-	12.5	-	nC
Q_{gs}	Gate-Source Charge		-	5.5	-	nC
Q_{gd}	Gate-Drain Charge		-	5	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = -15V, R_G = 3.3\Omega,$ $V_{GS} = -10V, I_{DS} = -15A$	-	4.5	-	ns
t_r	Turn-On Rise Time		-	11	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	34	-	ns
t_f	Turn-Off Fall Time		-	18	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-29	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_{SD} = -1A$	-	-	-1.3	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.

P-Channel Typical Performance Characteristics

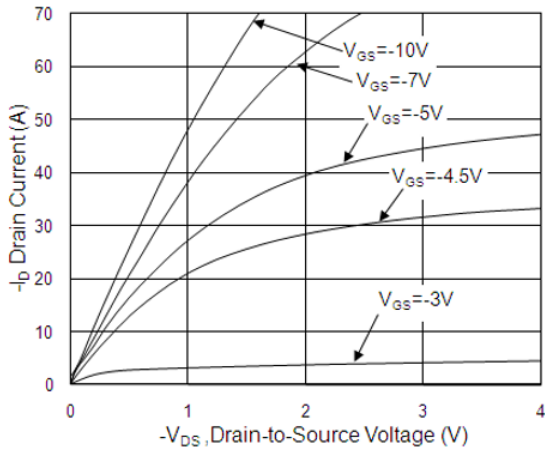


Figure 1. Output Characteristics

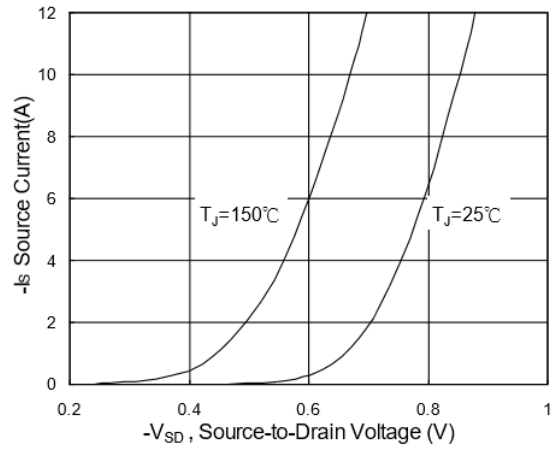


Figure 2. Forward Characteristics of Reverse

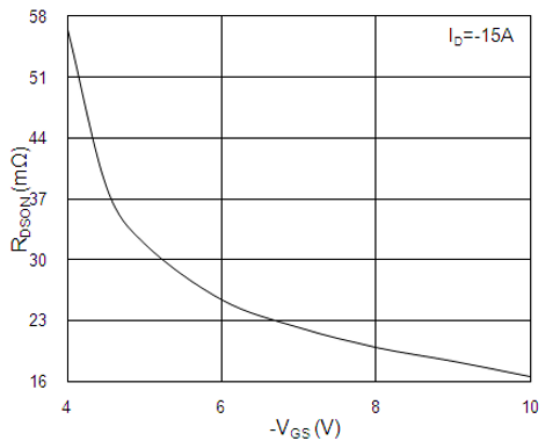


Figure 3. On-Resistance vs. Gate-Source

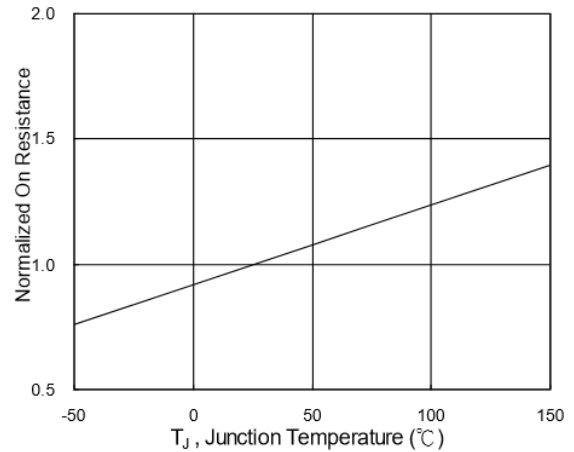


Figure 4. Drain-to-Source On Resistance

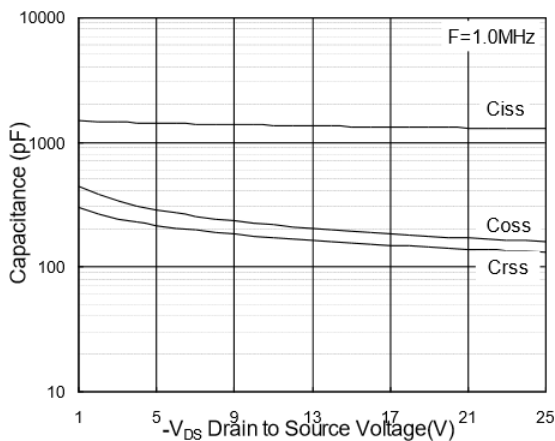


Figure 5. Capacitance Characteristics

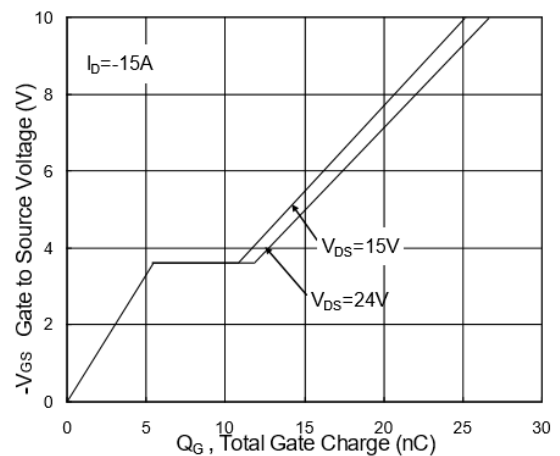


Figure 6. Gate Charge Characteristics

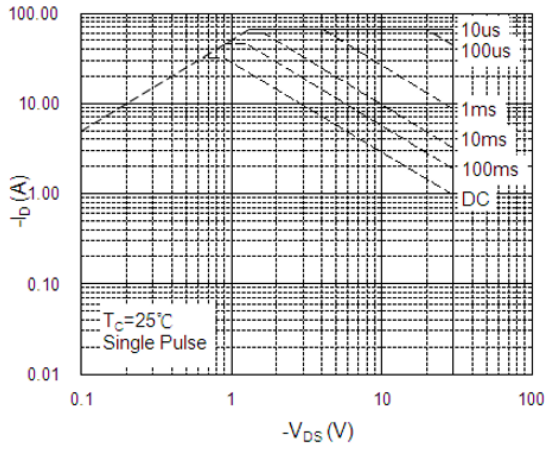


Figure 7. Maximum Safe Operating Area

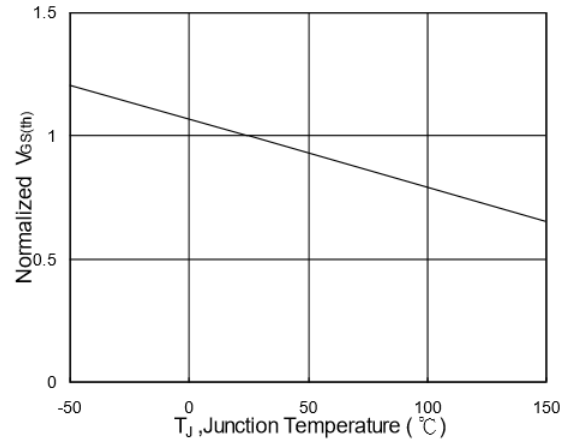


Figure 8. Normalized $V_{GS(th)}$ vs. T_J

SFI60Y03AT Product Description

Silicon N-Channel MOSFET



NOTE:

1. We strongly recommend customers check carefully on the trademark when buying our product, if there is any question, please don't be hesitate to contact us.
2. Please do not exceed the absolute maximum ratings of the device when circuit designing.
3. Winsemi Microelectronics Co., Ltd reserved the right to make changes in this specification sheet and is subject to change without prior notice.

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