

## N-Channel 30-V (D-S) MOSFET

- FEATURES**

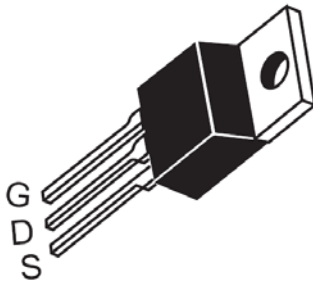
$R_{DS(ON)} \leq 7.5m\Omega @ V_{GS}=10V$

$R_{DS(ON)} \leq 10m\Omega @ V_{GS}=4.5V$

high density cell design for extremely low  $R_{DS(ON)}$

Exceptional on-resistance and maximum DC current capability

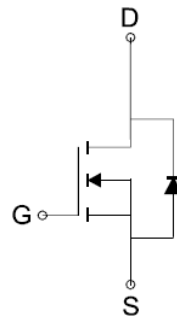
- PIN CONFIGURATION**



TO220

- GENERAL DESCRIPTION**

The FS73A3 combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ . This device is ideal for load switch and battery protection applications.



N-Channel MOSFET

- Absolute Maximum Ratings ( $T_A=25^\circ C$  Unless Otherwise Noted)**

Parameter	Symbol	Limit	Units
Drain-Source Voltage	VDS	30	V
Gate-Source Voltage	VGS	$\pm 20$	V
Drain Current-Continuous	ID	65	A
Drain Current-Pulsed a	IDM	200	A
Maximum Power Dissipation @ $T_C = 25^\circ C$ -Derate above $25^\circ C$	PD	78	W
		0.53	W/ $^\circ C$
Single Pulsed Avalanche Energy <sup>d</sup>	EAS	160	mJ
Single Pulsed Avalanche Current <sup>d</sup>	IAS	25	A
Operating and Store Temperature Range	TJ, Tstg	-55 to 175	C

### Thermal Characteristics

Parameter	Symbol	Limit	Units
Thermal Resistance, Junction-to-Case	RqJC	1.9	$^\circ C/W$
Thermal Resistance, Junction-to-Ambient	RqJA	62.5	$^\circ C/W$



● **Electrical Characteristics** ( $T_J=25^{\circ}\text{C}$  unless otherwise noted)

Symbol	Parameter	Limit	Min	Typ	Max	Unit
<b>STATIC</b>						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V, ID=250 $\mu$ A	30			V
VGS(th)	Gate Threshold Voltage <sup>b</sup>	VDS=VGS, ID=250 $\mu$ A	1.3	1.8	3	V
IGSS	Gate Leakage Current	VDS=0V, VGS= $\pm$ 20V			$\pm$ 100	nA
IDSS	Zero Gate Voltage Drain Current	VDS=30V, VGS=0V			1	$\mu$ A
RDS(ON)	Drain-Source On-State Resistance <sup>a</sup>	VGS=10V, ID= 50A		7.5	9	m $\Omega$
		VGS=4.5V, ID= 40A		10	13	
VSD	Diode Forward Voltage	IS=2.7A, VGS=0V		0.72	1.1	V
<b>DYNAMIC <sup>c</sup></b>						
Qg	Total Gate Charge(10V)	VDS=15V, VGS=10V, ID=17A		55		nC
Qg	Total Gate Charge(4.5V)	VDS=15V, VGS=4.5V, ID=17A		29		
Qgs	Gate-Source Charge			10		
Qgd	Gate-Drain Charge			15		
Ciss	Input capacitance	VDS=15V, VGS=0V, f=1.0MHz		3400		pF
Coss	Output Capacitance			550		
Crss	Reverse Transfer Capacitance			210		
Rg	Gate-Resistance	VDS=0V, VGS=0V, f=1MHz		1.2		$\Omega$
td(on)	Turn-On Delay Time	VDD=15V, RL =15 $\Omega$ ID=1A, VGEN=10V RG=6 $\Omega$		23		ns
tr	Turn-On Rise Time			12		
td(off)	Turn-Off Delay Time			86		
tf	Turn-Off Fall Time			12		

Note:

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

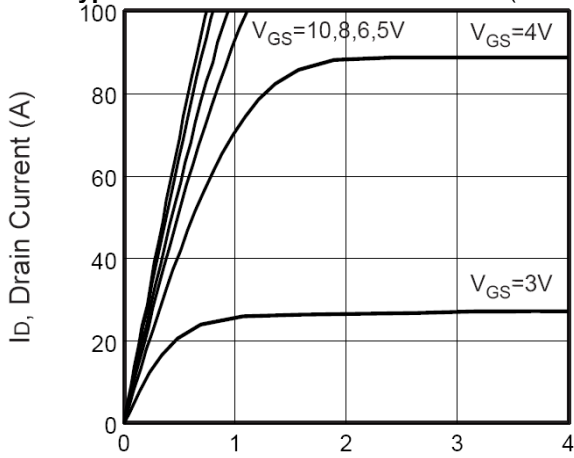
b: FORSEMI reserves the right to improve product design, functions and reliability without notice.

c. Guaranteed by design, not subject to production testing.

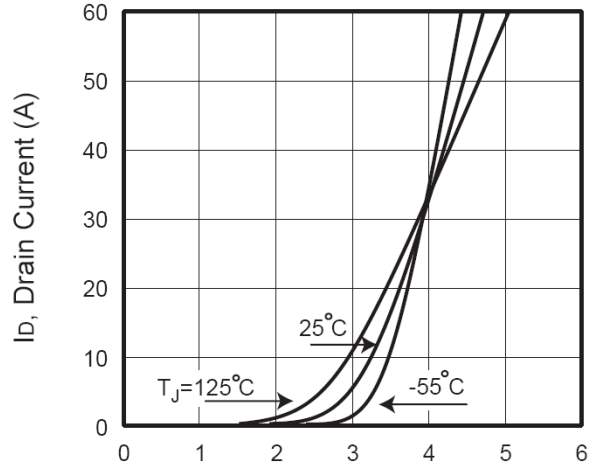
d. L = 0.5mH, IAS = 35A, VDD = 24V, RG = 25 $\Omega$ , Starting  $T_J = 25^{\circ}\text{C}$



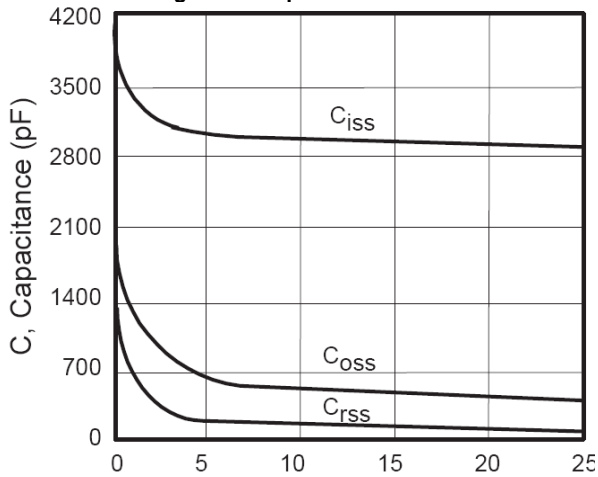
● Typical Performance Characteristics (T = 25°C)



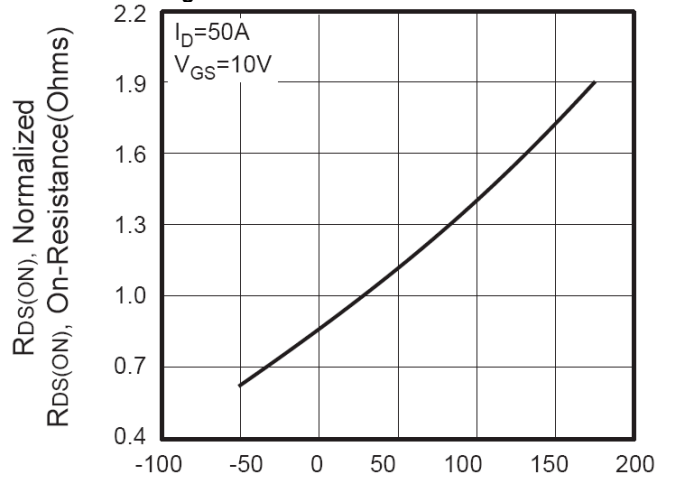
$V_{DS}$ , Drain-to-Source Voltage (V)  
Figure 1. Output Characteristics



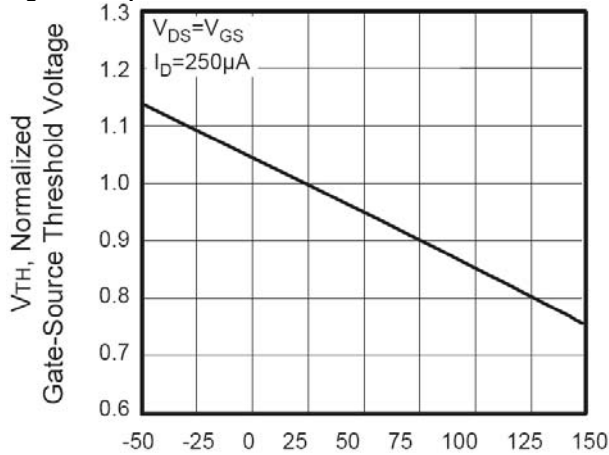
$V_{GS}$ , Gate-to-Source Voltage (V)  
Figure 2. Transfer Characteristics



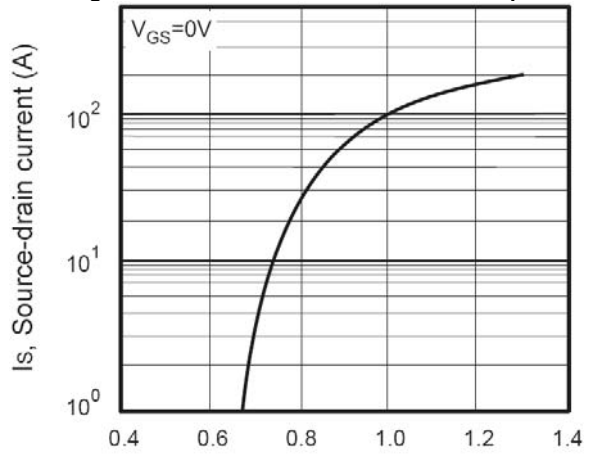
$V_{DS}$ , Drain-to-Source Voltage (V)  
Figure 3. Capacitance



$T_J$ , Junction Temperature (°C)  
Figure 4. On-Resistance Variation with Temperature



$T_J$ , Junction Temperature (°C)  
Figure 5. Gate Threshold Variation with Temperature



$V_{SD}$ , Body Diode Forward Voltage (V)  
Figure 6. Body Diode Forward Voltage Variation with Source Current

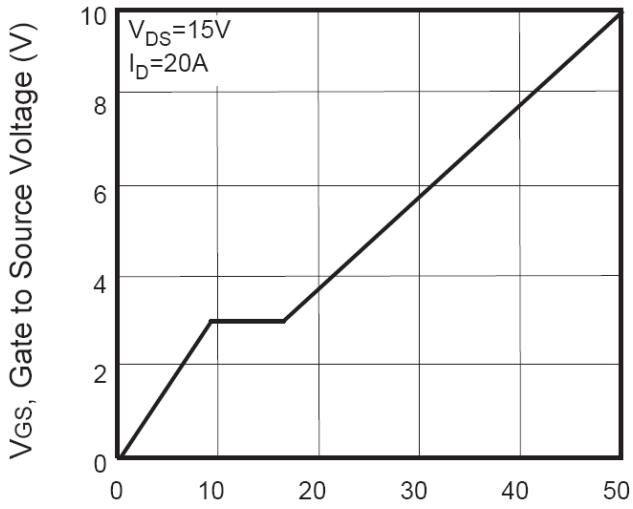


Figure 7. Gate Charge

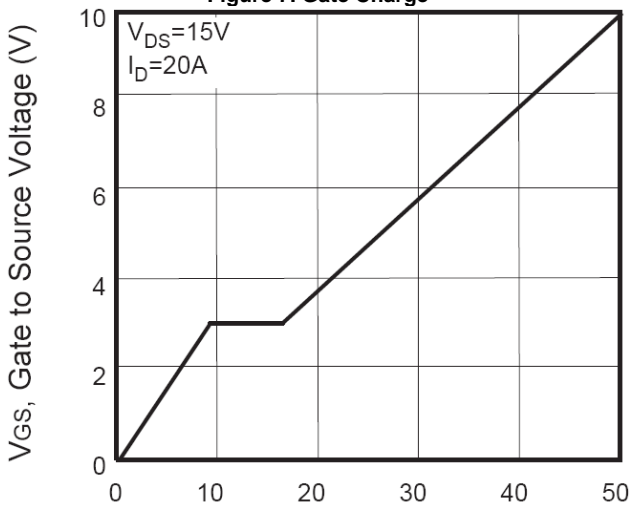


Figure 7. Gate Charge

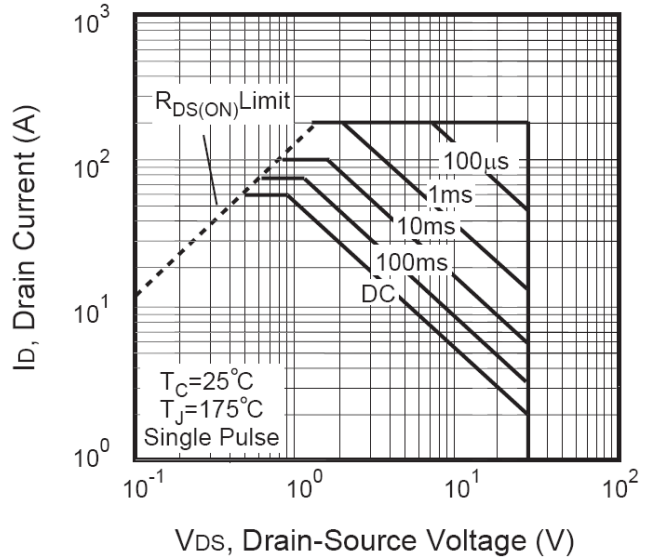


Figure 8. Maximum Safe Operating Area

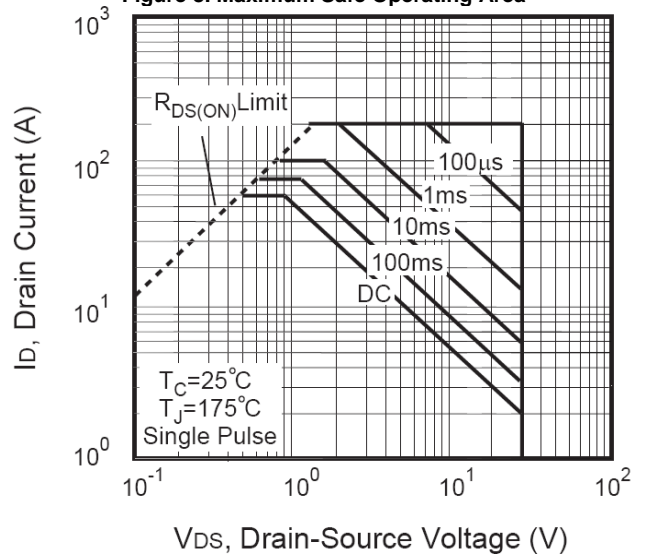
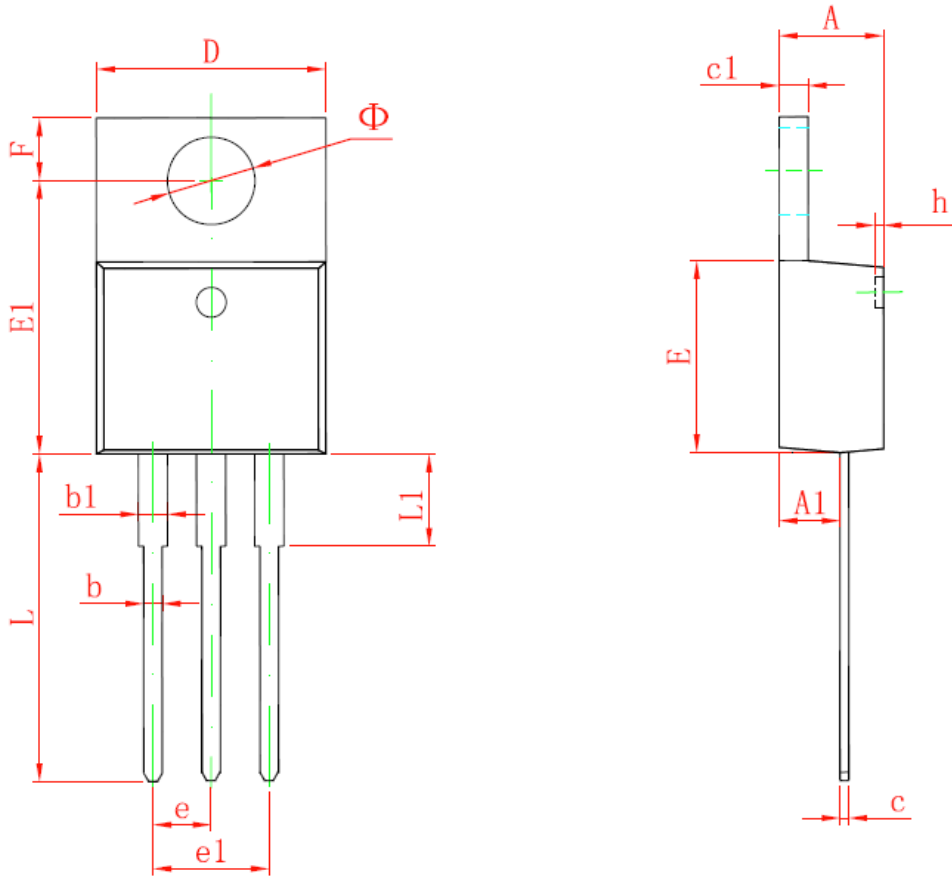


Figure 8. Maximum Safe Operating Area



● **PACKAGE**

**TO220**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.470	4.670	0.176	0.184
A1	2.520	2.820	0.099	0.111
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
E1	12.060	12.460	0.475	0.491
e	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
F	2.590	2.890	0.102	0.114
h	0.000	0.300	0.000	0.012
L	13.400	13.800	0.528	0.543
L1	3.560	3.960	0.140	0.156
$\Phi$	3.735	3.935	0.147	0.155