P-Channel -30V (D-S) MOSFET

● FEATURES

$R_{DS(ON)} \leqq 13m\Omega @ V_{GS}=-10V$

$R_{DS(ON)} \leqq 17m\Omega @ V_{GS}=-4.5V$

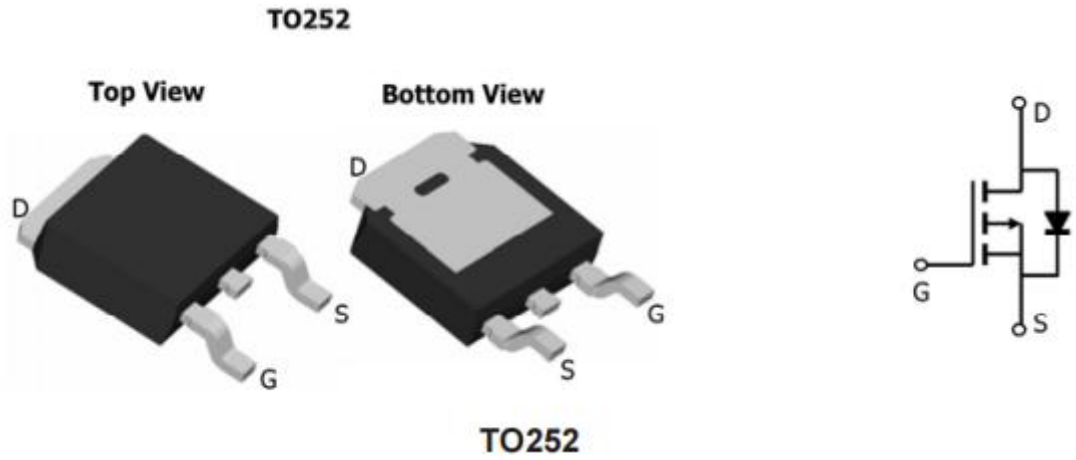
high density cell design for extremely low $R_{DS(ON)}$

Exceptional on-resistance and maximum DC current capability

● GENERAL DESCRIPTION

The LSP51 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.

● PIN CONFIGURATION



TO252

● Absolute Maximum Ratings (T_A=25℃ Unless Otherwise Noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	-35	A
Pulsed Drain Current	I_{DM}	-50	A
Maximum Power Dissipation	P_D	35	W
Derating factor		0. 28	W/℃
Single pulse avalanche energy (Note 5)	E_{AS}	300	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

* The device mounted on 1in$_2$ FR4 board with 2 oz copper

Electrical Characteristics (T_J=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250μA	-31	-33	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics(Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-1	-1.6	-2.2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-10A V_{GS}=-4.5V, I_D=-10A	-	9 13	13 17	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-10V,I_D=-15A	-	20	-	S
Dynamic Characteristics(Note4)						
Input Capacitance	C_{lss}	V_{DS}=-15V,V_{GS}=0V, F=1.0MHz	-	3250	-	PF
Output Capacitance	C_{oss}		-	605	-	PF
Reverse Transfer Capacitance	C_{rss}		-	565	-	PF
Switching Characteristics(Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-15V,I_D=-10A V_{GS}=-10V,R_{GEN}=6Ω	-	13	-	nS
Turn-on Rise Time	t_r		-	12	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	50	-	nS
Turn-Off Fall Time	t_f		-	14	-	nS
Total Gate Charge	Q_g	V_{DS}=-15V,I_D=-10A, V_{GS}=-10V	-	84	-	nC
Gate-Source Charge	Q_{gs}		-	11.7	-	nC
Gate-Drain Charge	Q_{gd}		-	25	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage(Note 3)	V_{SD}	V_{GS}=0V,I_S=-10A	-	-0.85	-1.2	V
Diode Forward Current(Note 2)	I_S		-	-	-50	A
Reverse Recovery Time	t_{rr}	TJ = 25°C, IF = -10A di/dt = 100A/μs(Note3)	-	-	45	nS
Reverse Recovery Charge	Qrr		-	-	43	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Note:
a: Pulse test: pulse width＜=300us, duty cycle＜=2%
b: FORSEMI reserves the right to improve product design, functions and reliability without notice.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

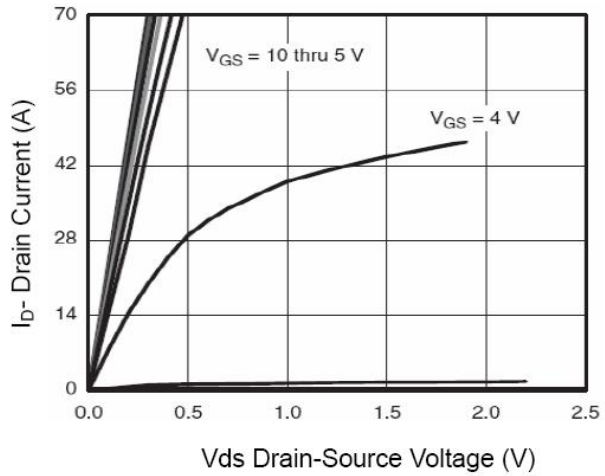


Figure 1 Output Characteristics

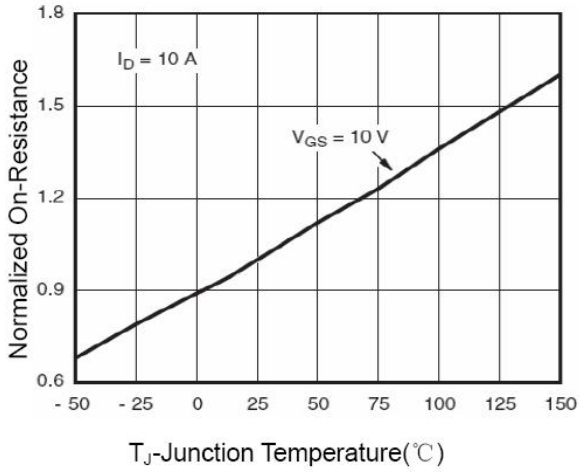


Figure 4 Rdson-Junction Temperature

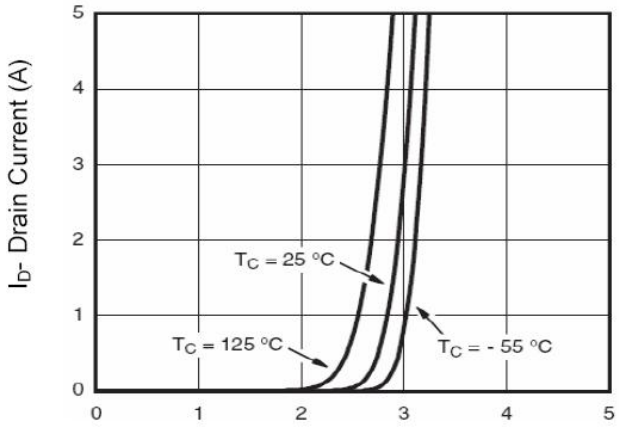


Figure 2 Transfer Characteristics

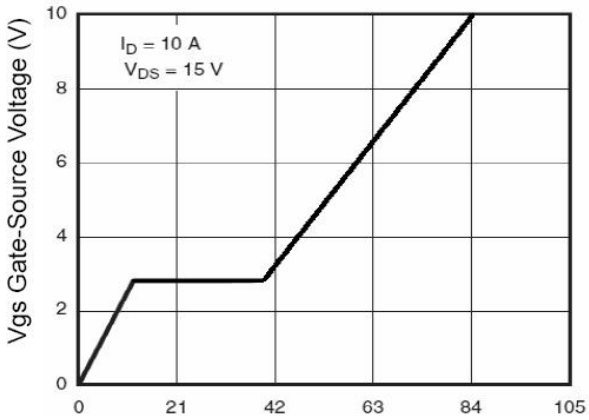


Figure 5 Gate Charge

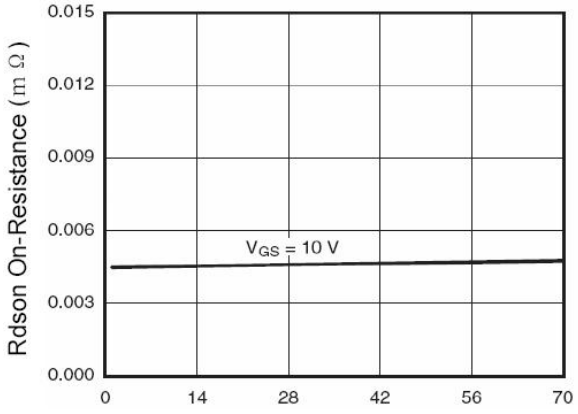


Figure 3 Rdson- Drain Current

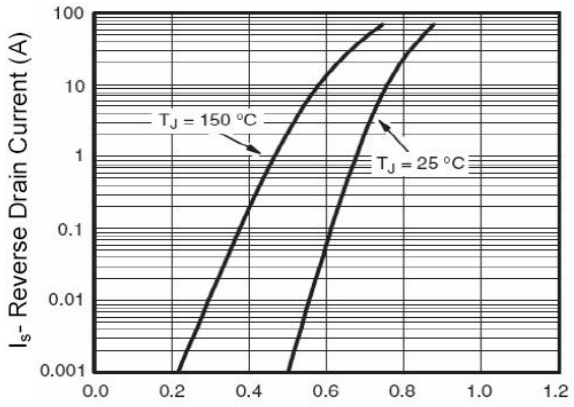
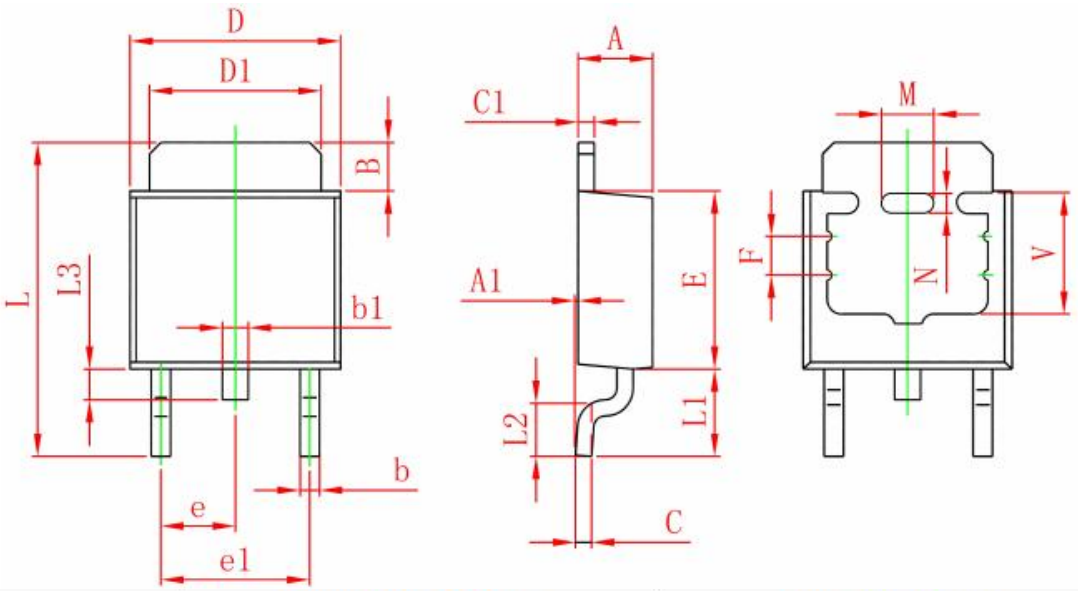


Figure 6 Source- Drain Diode Forward

- **PACKAGE TO252**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
F	1.200REF.		0.047REF.	
M	1.600REF.		0.063REF.	
N	0.450REF.		0.018REF.	
L	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035
V	3.800 REF		0.150 REF	