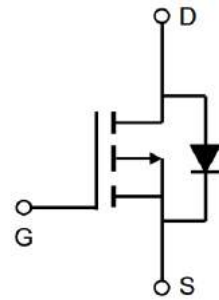


## -15V P-Channel Enhancement Mode MOSFET

### Description

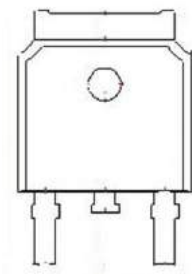
The 100P01D uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



### General Features

$V_{DS} = -15V$   $I_D = -100A$

$R_{DS(ON)} < 3.5m\Omega$  @  $V_{GS}=10V$



### Application

Battery protection

Load switch

Uninterruptible power supply



### Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	-15	V
V <sub>GS</sub>	Gate-Source Voltage	±12	V
I <sub>D</sub>	Drain Current – Continuous (T <sub>C</sub> =25°C)	-100	A
	Drain Current – Continuous (T <sub>C</sub> =100°C)	-54	A
I <sub>DM</sub>	Drain Current – Pulsed <sup>1</sup>	-360	A
P <sub>D</sub>	Power Dissipation (T <sub>C</sub> =25°C)	41.67	W
	Power Dissipation – Derate above 25°C	0.33	W/°C
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C
R <sub>θJA</sub>	Thermal Resistance Junction to ambient	62	°C/W
R <sub>θJC</sub>	Thermal Resistance Junction to Case	3	°C/W

## -15V P-Channel Enhancement Mode MOSFET

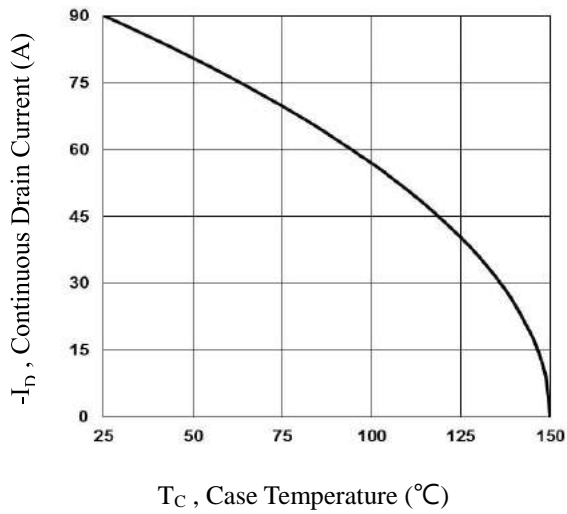
### Electrical Characteristics (TA=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-15	20	---	V
ΔBVDSS/ ΔT <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =-1mA	---	-0.008	---	V/°C
RDS(ON)	Static Drain-Source On-Resistance	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-20A	---	2.7	3.5	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-20A	---	3.8	5.0	
VGS(th)	Gate Threshold Voltage		-0.4	-0.6	-1.0	V
ΔVGS	V <sub>GS(th)</sub> Temperature Coefficient	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA	---	-3.44	---	mV/°C
IDSS	Drain-Source Leakage Current	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	-1	uA
		V <sub>DS</sub> =-16V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C	---	---	-30	uA
IGSS	Gate-Source Leakage Current	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V	---	---	±500	nA
gfs	Forward Transconductance	V <sub>DS</sub> =-10V, I <sub>S</sub> =-3A	---	30	---	S
Q <sub>g</sub>	Total Gate Charge <sup>2, 3</sup>	V <sub>DS</sub> =-16V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-5A	---	149	225	nC
Q <sub>gs</sub>	Gate-Source Charge <sup>2, 3</sup>		---	14.4	22	
Q <sub>gd</sub>	Gate-Drain Charge <sup>2, 3</sup>		---	42.8	65	
Td(on)	Turn-On Delay Time <sup>2, 3</sup>	V <sub>DD</sub> =-15V, V <sub>GS</sub> =-4.5V, R <sub>G</sub> =25, I <sub>D</sub> =-1A	---	21.2	42	nS
T <sub>r</sub>	Rise Time <sup>2, 3</sup>		---	20.6	40	
Td(off)	Turn-Off Delay Time <sup>2, 3</sup>		---	26	52	
T <sub>f</sub>	Fall Time <sup>2, 3</sup>		---	400	600	
Ciss	Input Capacitance	V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, F=1MHz	---	12000	16000	pF
Coss	Output Capacitance		---	1670	2500	
Crss	Reverse Transfer Capacitance		---	730	1100	
Rg	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz	---	2.6	---	Ω
IS	Contineous Source Current	Vg=Vd=0V, Force Current	--	--	-90	A
ISM	Pulsed Source Current		--	--	-180	
VSD	Diode Forward Voltage	Vgs=0V Is=1A Tj=25°C	--	--	-1	V

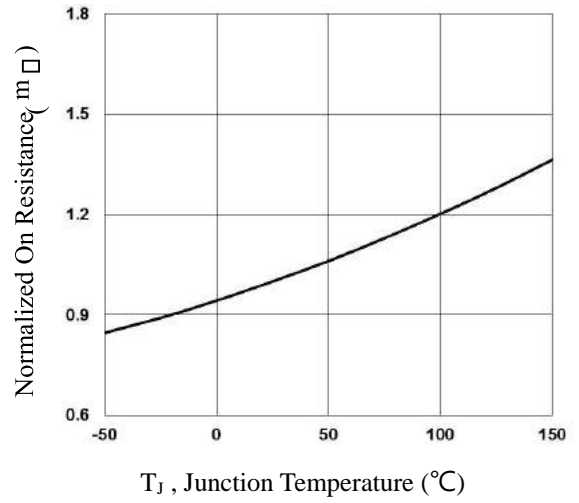
Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

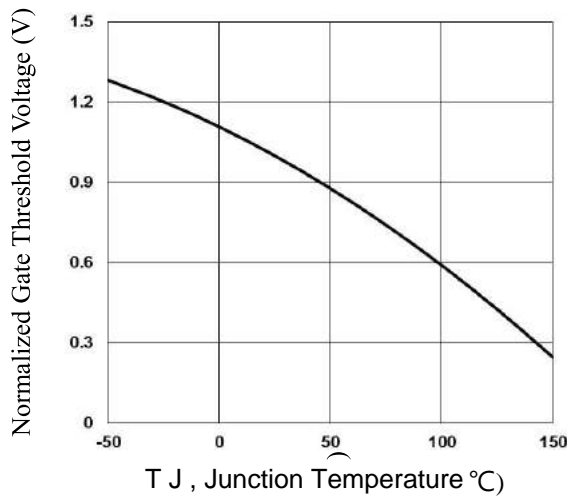
## -15V P-Channel Enhancement Mode MOSFET



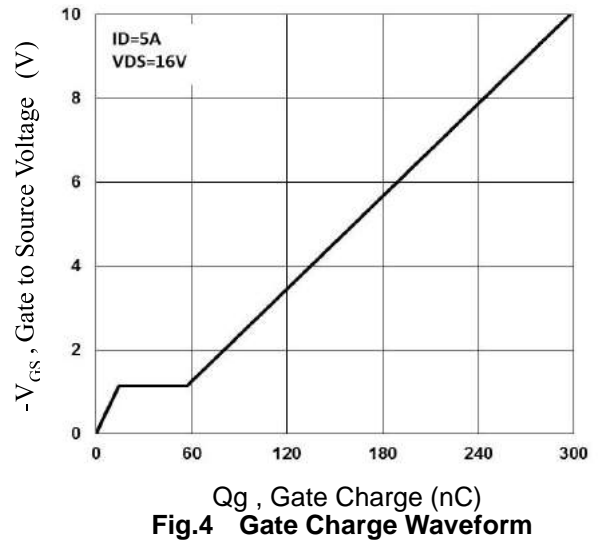
**Fig.1 Continuous Drain Current**



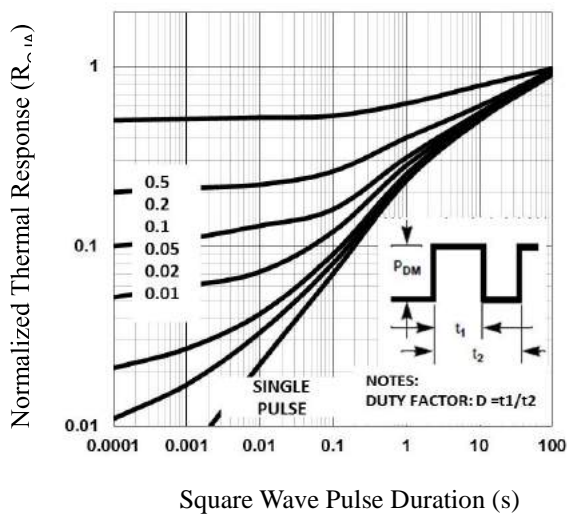
**Fig.2 Normalized RDSON vs.  $T_J$**



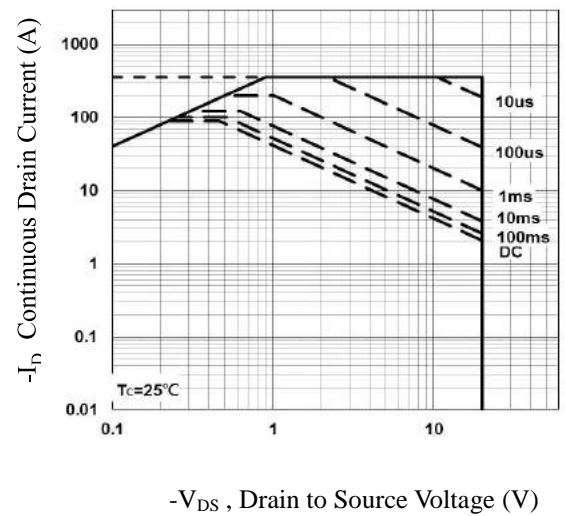
**Fig.3 Normalized  $V_{th}$  vs.  $T_J$**



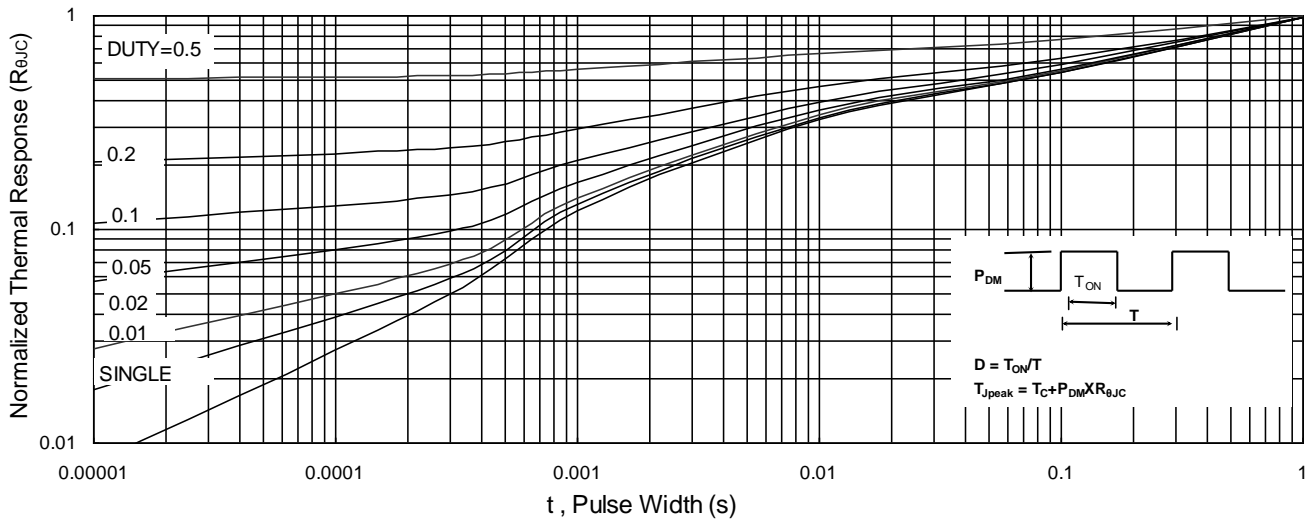
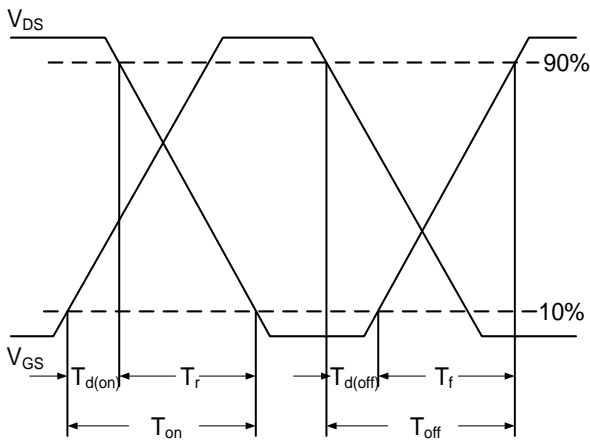
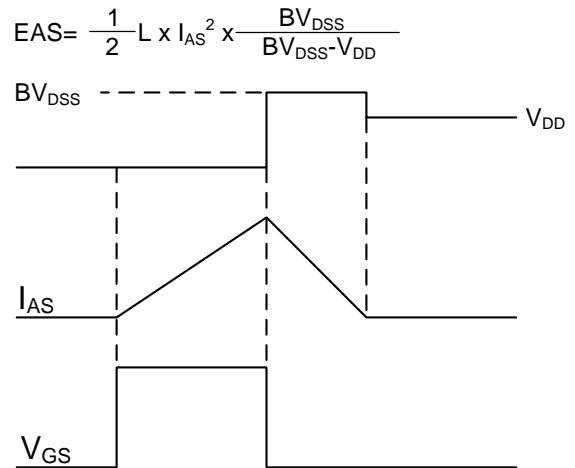
**Fig.4 Gate Charge Waveform**



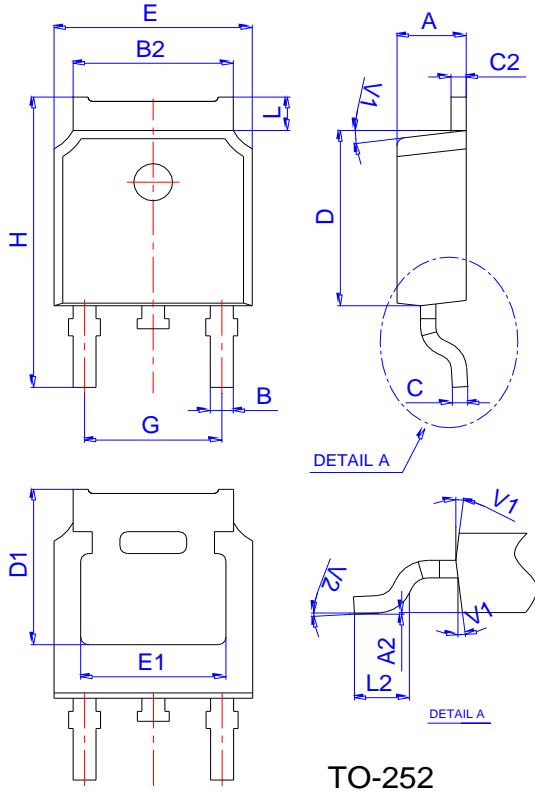
**Fig.5 Normalized Transient Response**



**Fig.6 Maximum Safe Operation Area**

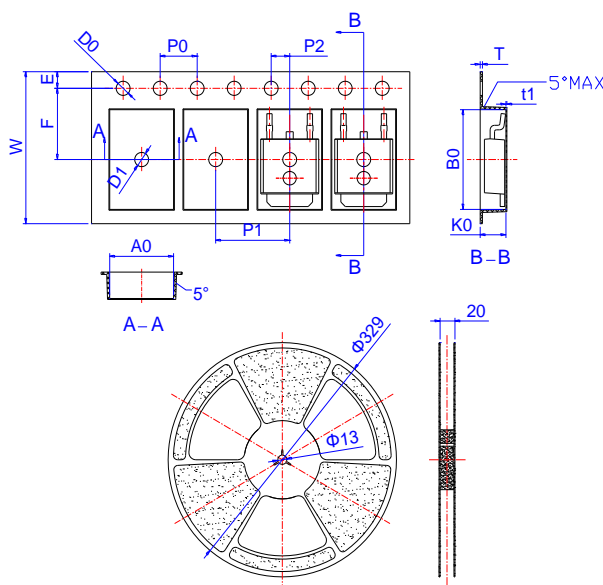

**Fig.9 Normalized Maximum Transient Thermal Impedance**

**Fig.10 Switching Time Waveform**

**Fig.11 Unclamped Inductive Switching Waveform**

### Package Mechanical Data



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2		0°	6°	0°	7°	6°

### Reel Spectification-TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.270	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583