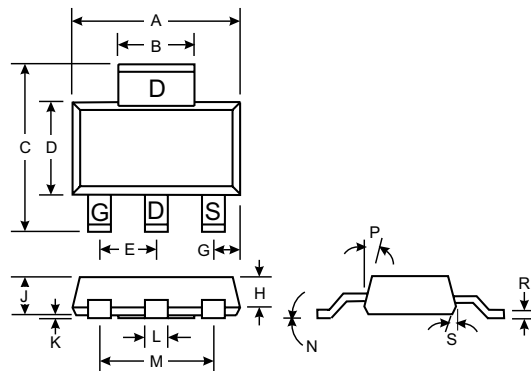


**P-CHANNEL ENHANCEMENT MODE  
FIELD EFFECT TRANSISTOR**
**Features**

- High Cell Density DMOS Technology
- Low On-State Resistance
- High Power and Current Capability
- Fast Switching Speed
- High Transient Tolerance



SOT-223		
Dim	Min	Max
A	6.30	6.71
B	2.90	3.10
C	6.71	7.29
D	3.30	3.71
E	2.22	2.35
G	0.92	1.00
H	1.10	1.30
J	1.55	1.80
K	0.025	0.102
L	0.66	0.79
M	4.55	4.70
N	—	10°
P	10°	16°
R	0.254	0.356
S	10°	16°
All Dimensions in mm		

**Mechanical Data**

- SOT-223 Plastic Case
- Terminal Connections: See Outline Drawing and Internal Circuit Diagram Above

**Maximum Ratings** 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current	$I_D$	$\pm 3.0$	A
Note 1a Continuous Pulsed		$\pm 20$	
Maximum Power Dissipation	$P_d$	3.0	W
Note 1a		1.3	
Note 1b Note 1c		1.1	
Operating and Storage Temperature Range	$T_J, T_{STG}$	-65 to +150	°C

**Thermal Characteristics**

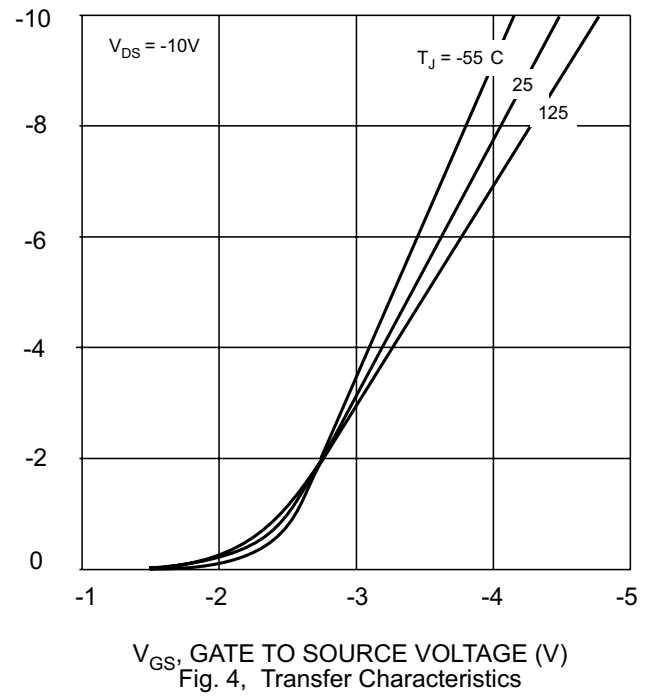
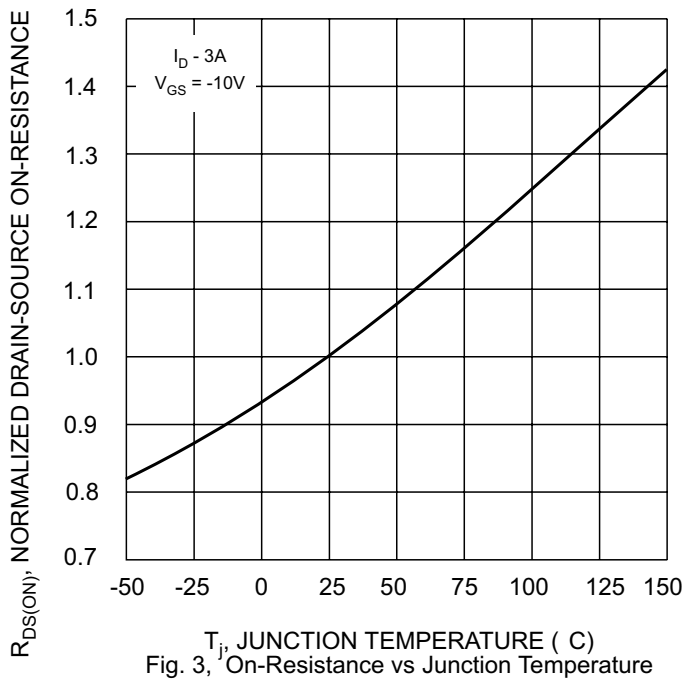
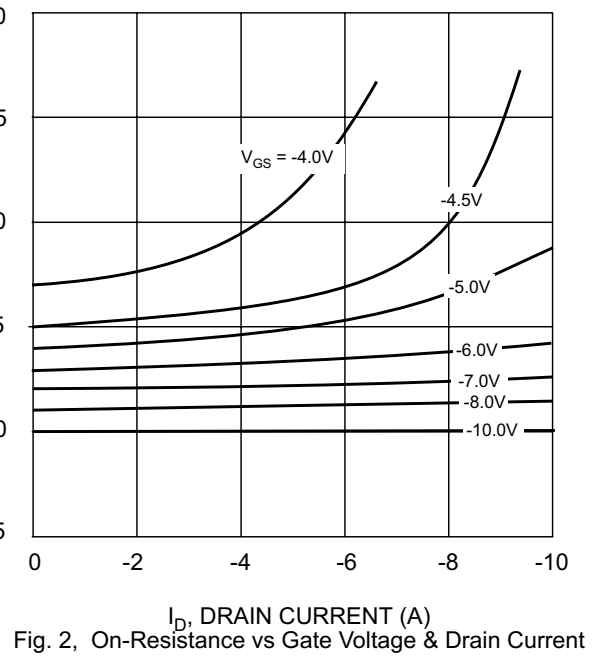
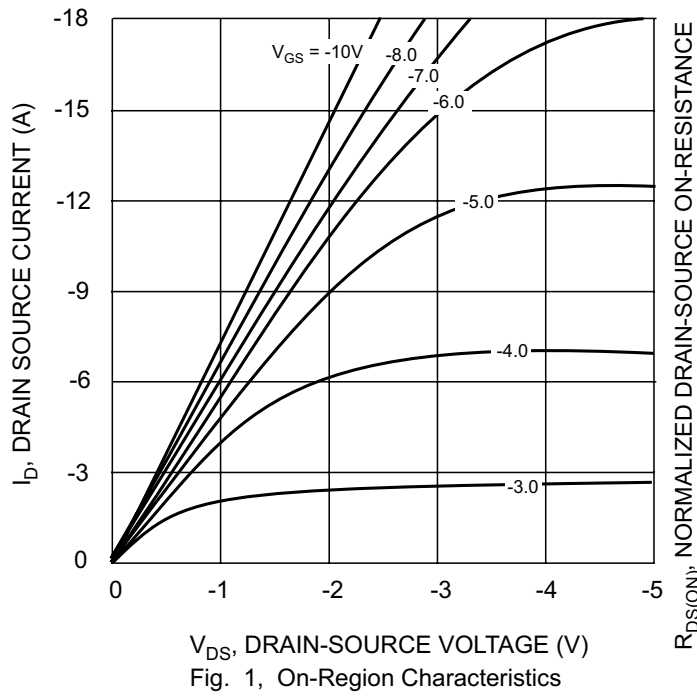
Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	42	°C/W
Note 1		12	
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	12	°C/W

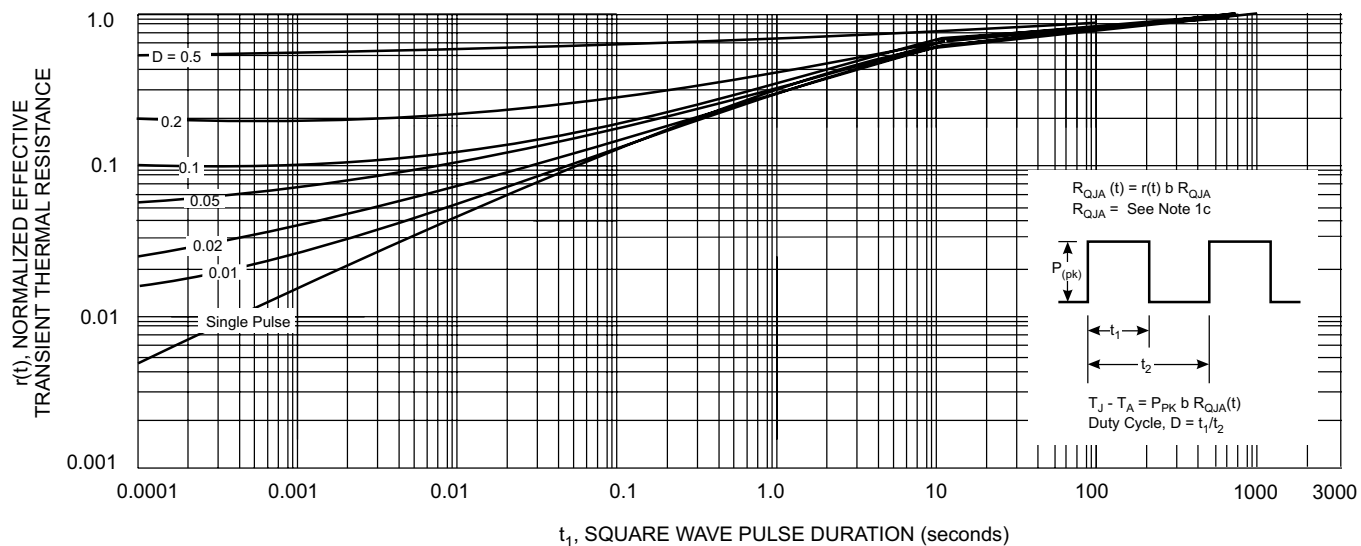
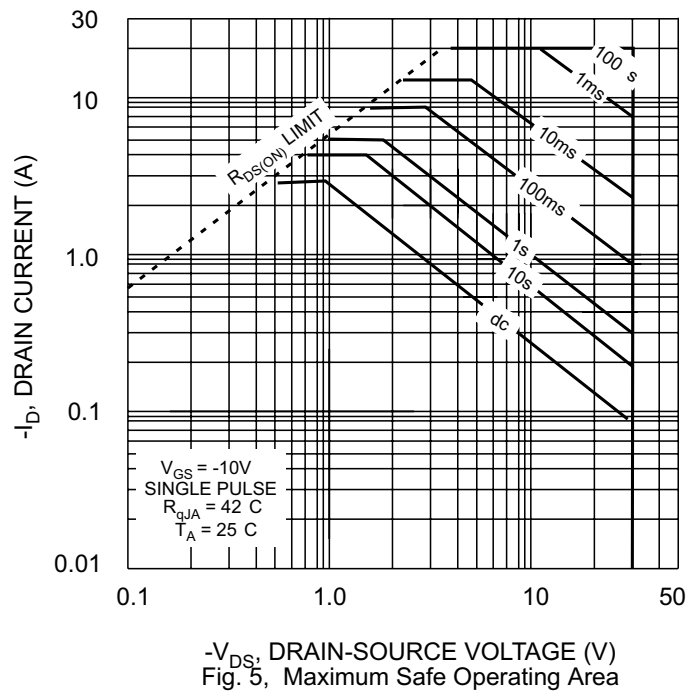
- Notes: 1.  $R_{\theta JA}$  is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins.  $R_{\theta JC}$  is guaranteed by design while  $R_{\theta CA}$  is determined by the user's board design.
- 1a. With 1 in<sup>2</sup> oz 2 oz. copper mounting pad  $R_{\theta JA} = 42^\circ\text{C/W}$ .
- 1b. With 0.0066 in<sup>2</sup> oz 2 oz. copper mounting pad  $R_{\theta JA} = 95^\circ\text{C/W}$ .
- 1c. With 0.0123 in<sup>2</sup> oz 2 oz. copper mounting pad  $R_{\theta JA} = 110^\circ\text{C/W}$ .

## Electrical Characteristics 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	30	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current T <sub>j</sub> = 55°C	I <sub>DSS</sub>	—	—	1.0 10	μA	V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V
Gate-Body Leakage, Forward	I <sub>GSSF</sub>	—	—	100	nA	V <sub>GS</sub> = 20V, V <sub>DS</sub> = 0V
Gate-Body Leakage, Reverse	I <sub>GSSR</sub>	—	—	-100	nA	V <sub>GS</sub> = 20V, V <sub>DS</sub> = 0V
ON CHARACTERISTICS (Note 2)						
Gate Threshold Voltage T <sub>j</sub> = 125°C	V <sub>GS(th)</sub>	-1.0 -0.7	1.6 1.2	3.0 2.2	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance T <sub>j</sub> = 125°C	R <sub>DS (ON)</sub>	—	0.030 0.042 0.042 0.058	0.035 0.070 0.055 0.100	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 7.2A V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 6.0A
On-State Drain Current	I <sub>D(ON)</sub>	25 15	—	—	A	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 5.0V V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 5.0V
Forward Transconductance	g <sub>FS</sub>	—	11	—	m	V <sub>DS</sub> = 10V, I <sub>D</sub> = 7.2A
DYNAMIC CHARACTERISTICS						
Input Capacitance	C <sub>ISS</sub>	—	720	—	pF	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>OSS</sub>	—	370	—	pF	
Reverse Transfer Capacitance	C <sub>RSS</sub>	—	250	—	pF	
SWITCHING CHARACTERISTICS (Note 2)						
Turn-On Delay Time	t <sub>D(ON)</sub>	—	12	20	ns	V <sub>DD</sub> = 10V, I <sub>D</sub> = 1.0A V <sub>GEN</sub> = 10V, R <sub>GEN</sub> = 6.0Ω
Turn-On Rise Time	t <sub>r</sub>	—	13	30	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	29	50	ns	
Turn-Off Fall Time	t <sub>f</sub>	—	10	20	ns	
Total Gate Charge	Q <sub>g</sub>	—	19	30	nC	V <sub>DS</sub> = 10V, I <sub>D</sub> = 3.0A. V <sub>GS</sub> = 10V
Gate-Source Charge	Q <sub>gs</sub>	—	2.3	—	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	5.5	—	nC	
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Max Continuous Drain-Source Diode Forward Current	I <sub>S</sub>	—	—	2.3	A	
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	—	0.9	1.3	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 7.2A (Note 2)

Notes: 2. Pulse Test: Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2.0\%$ .





Remark: Thermal characterization performed under conditions described in note 1c. Transient thermal response will change depending on the circuit board design.