



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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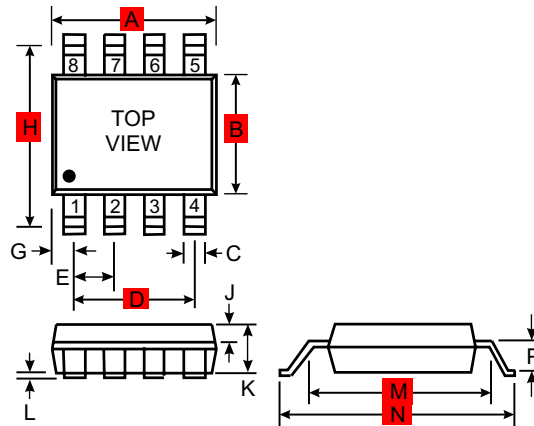
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



**SINGLE 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



SO-8		
Dim	Min	Max
A	3.94	4.19
B	3.20	3.40
C	0.381	0.495
D	2.67	3.05
E	0.89	1.02
G	0.527	0.679
J	0.41 Nominal	
K	0.94	1.09
L	0.025	0.152
M	4.37	4.62
N	4.39	4.70
P	0.939 Nominal	
All Dimensions in mm		

**Mechanical Data**

- SO-8 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	$V_{DSS}$	-20	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Drain Current Note 1a Continuous @ $T_A = 25^\circ\text{C}$ Note 1a Continuous @ $T_A = 70^\circ\text{C}$ Pulsed @ $T_A = 25^\circ\text{C}$	$I_D$	$\pm 5.3$ $\pm 4.2$ $\pm 15$	A
Maximum Power Dissipation Note 1a Note 1b Note 1c	$P_d$	2.5 1.2 1.0	W
Operating and Storage Temperature Range	$T_j, T_{STG}$	-55 to +150	$^\circ\text{C}$

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient Note 1a	$R_{\theta JA}$	50	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case Note 1	$R_{\theta JC}$	25	$^\circ\text{C/W}$

Notes: 1.  $R_{\theta JA}$  is the sum of the junction-to-case and case-to-ambient thermal resistance ( $R_{\theta JC} + R_{\theta CA}$ ) where the case thermal reference is defined as the solder mounting surface of the drain pins.  $R_{\theta JC}$  in this instance is  $25^\circ\text{C/W}$  but is dependent on the specific circuit board thermal design.

- 1a. With 1 in<sup>2</sup> of 2 oz. copper mounting pad  $R_{\theta JA} = 50^\circ\text{C/W}$ .
- 1b. With 0.04 in<sup>2</sup> of 2 oz. copper mounting pad  $R_{\theta JA} = 105^\circ\text{C/W}$ .
- 1c. With 0.006 in<sup>2</sup> of 2 oz. copper mounting pad  $R_{\theta JA} = 125^\circ\text{C/W}$ .

## Electrical Characteristics 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	-20	—	—	V	$V_{GS} = 0V, I_D = -25 \mu A$
Zero Gate Voltage Drain Current $T_j = 55^\circ C$	$I_{DSS}$	—	—	-1.0 -10	$\mu A$	$V_{DS} = -16V, V_{GS} = 0V$
Gate-Body Leakage, Forward	$I_{GSSF}$	—	—	100	nA	$V_{GS} = 20V, V_{DS} = 0V$
Gate-Body Leakage, Reverse	$I_{GSSR}$	—	—	-100	nA	$V_{GS} = -20V, V_{DS} = 0V$
<b>ON CHARACTERISTICS (Note 2)</b>						
Gate Threshold Voltage $T_j = 125^\circ C$	$V_{GS(th)}$	-1.0 -0.85	-2.0 -1.7	-3.0 -2.6	V	$V_{DS} = V_{GS}, I_D = -25 \mu A$
Static Drain-Source On-Resistance $T_j = 125^\circ C$	$R_{DS(on)}$	—	0.055 0.077 0.067 0.082 0.120	0.060 0.090 0.080 0.115 0.190	$\Omega$	$V_{GS} = -10V, I_D = -5.3A$ $V_{GS} = -10V, I_D = -5.3A$ $V_{GS} = -6.0V, I_D = -3.6A$ $V_{GS} = -4.5V, I_D = -2.0A$ $V_{GS} = -4.5V, I_D = -2.0A$
On-State Drain Current	$I_{D(on)}$	-15 -3.6	—	—	A	$V_{GS} = -10V, V_{DS} = -5.0V$ $V_{GS} = -4.5V, V_{DS} = -5.0V$
Forward Transconductance	$g_{FS}$	—	8.0	—	m	$V_{DS} = -15V, I_D = -5.3A$
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	$C_{ISS}$	—	1430	—	pF	$V_{DS} = -10V, V_{GS} = 0V$ $f = 1.0MHz$
Output Capacitance	$C_{OSS}$	—	810	—	pF	
Reverse Transfer Capacitance	$C_{RSS}$	—	375	—	pF	
<b>SWITCHING CHARACTERISTICS (Note 2)</b>						
Turn-On Delay Time	$t_{D(on)}$	—	13	30	ns	$V_{DD} = -10V, I_D = -1A$ $V_{GEN} = -10V, R_{GEN} = 6.0\Omega$
Turn-On Rise Time	$t_r$	—	22	60	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	66	120	ns	
Turn-Off Fall Time	$t_f$	—	28	100	ns	
Total Gate Charge	$Q_g$	—	38	—	nC	$V_{DS} = -10V, I_D = -5.3A$ $V_{GS} = -10V$
Gate-Source Charge	$Q_{gs}$	—	3.0	—	nC	
Gate-Drain Charge	$Q_{gd}$	—	12	—	nC	
<b>DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS</b>						
Max Continuous Drain-Source Diode Forward Current	$I_S$	—	—	-2.2	A	
Drain-Source Diode Forward Voltage	$V_{SD}$	—	-1.04	-1.2	V	$V_{GS} = 0V, I_S = -5.3A$ (Note 2)
Reverse Recovery Time	$t_{rr}$	—	80	100	ns	$V_{GS} = 0V, I_F = -5.3A$ , $di_F/dt = 100A/\mu s$

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

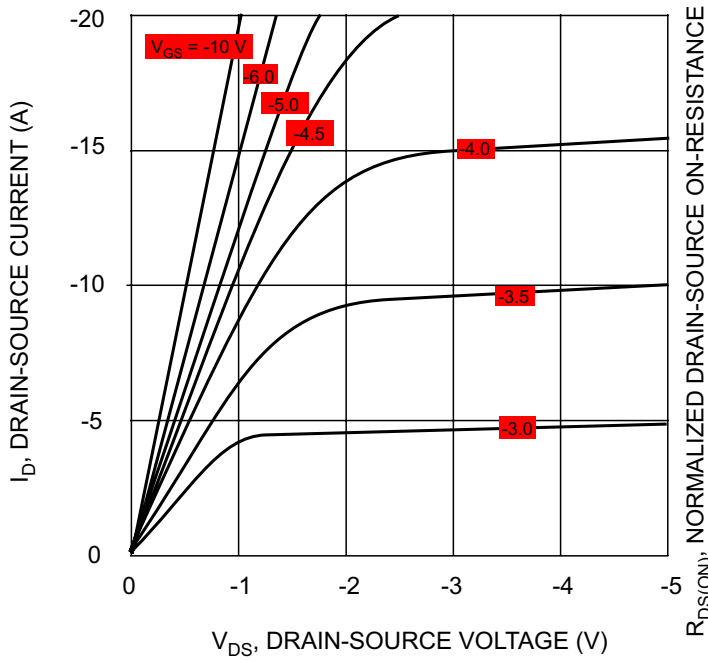


Fig. 1, On-Region Characteristics

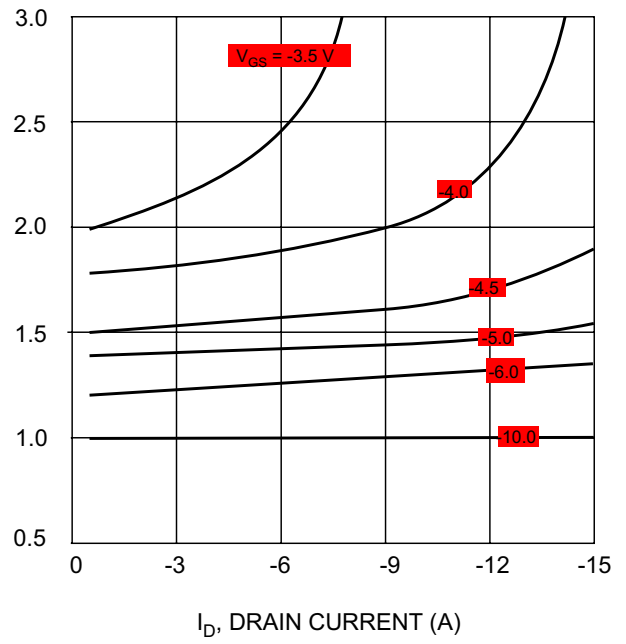


Fig. 2, On-Resistance vs Gate Voltage & Drain Current

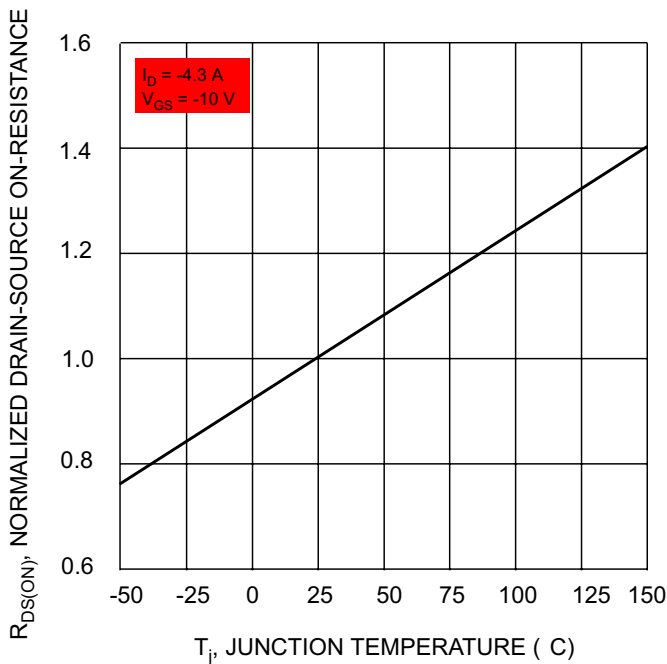


Fig. 3, On-Resistance vs Junction Temperature

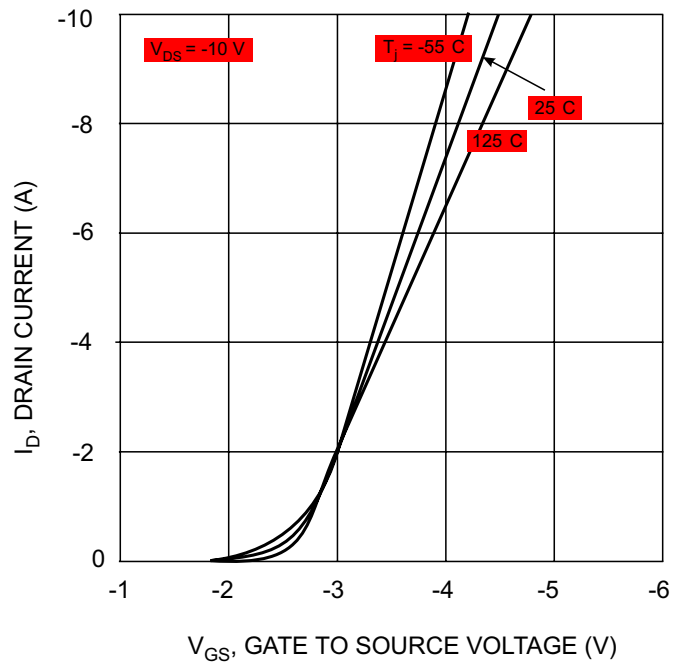
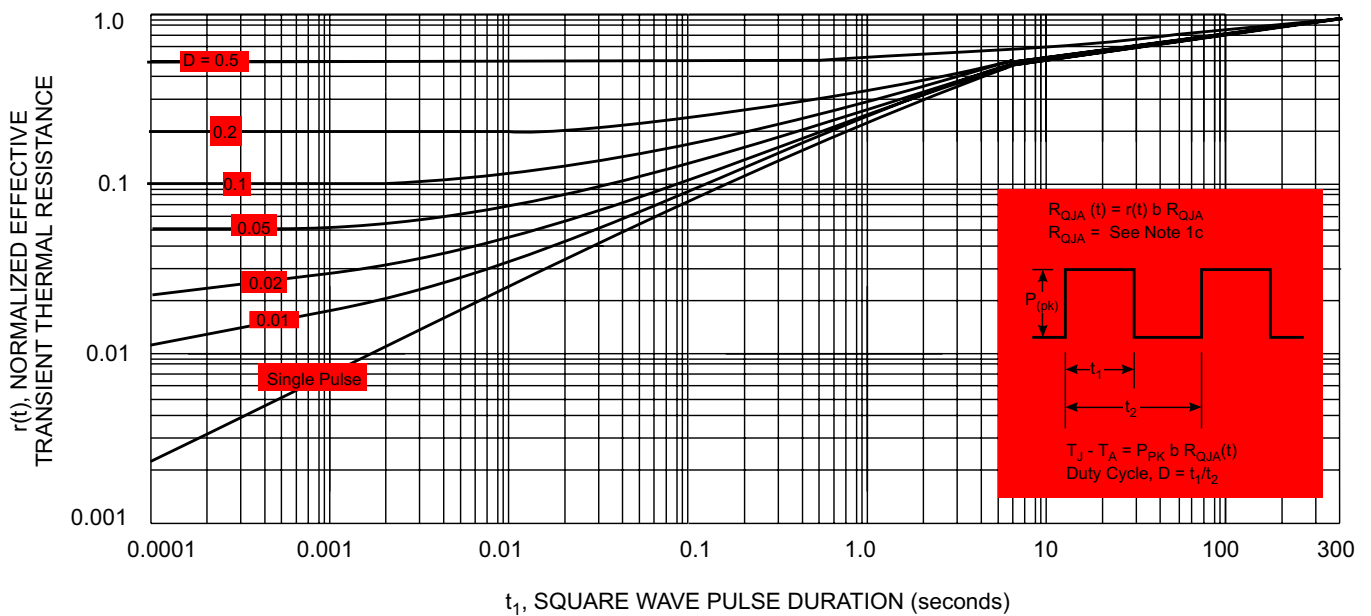
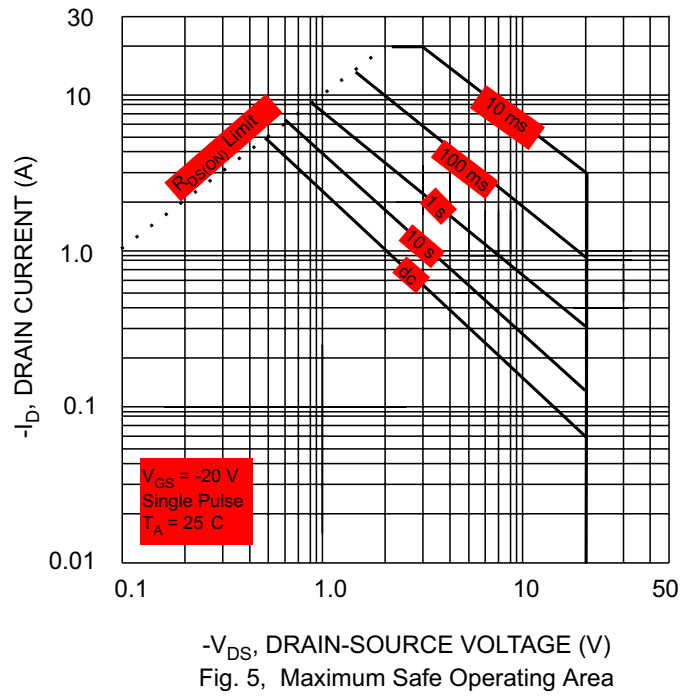


Fig. 4, Transfer Characteristics



Remark: Thermal characterization performed under conditions of Note 1c. Better thermal design such as shown in Notes 1a and 1b or 1d will offer lower  $R_{\theta JA}$  values and allow junction to reach thermal equilibrium sooner.