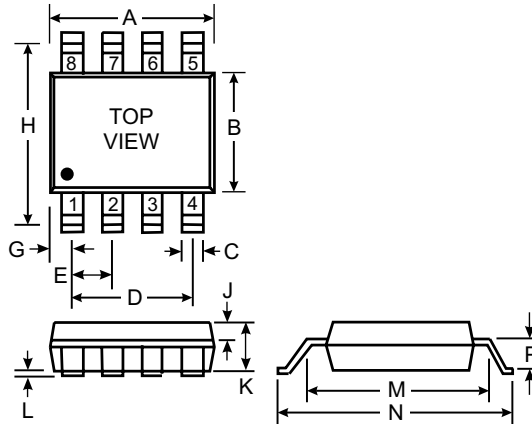


**SINGLE P-CHANNEL ENHANCEMENT MODE  
FIELD EFFECT TRANSISTOR**

**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	$V_{DSS}$	-30	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Drain Current	$I_D$	$\pm 5.3$	A
		$\pm 20$	
Maximum Power Dissipation	$P_d$	2.5	W
		1.2	
		1.0	
Operating and Storage Temperature Range	$T_j, T_{STG}$	-55 to +150	°C

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	50	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	25	°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°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 (continued)** 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	-30	—	—	V	$V_{GS} = 0V, I_D = -25 \mu A$
Zero Gate Voltage Drain Current $T_j = 70^\circ C$	$I_{DSS}$	—	—	-1.0 -5.0	$\mu A$	$V_{DS} = -24V, V_{GS} = 0V$ $V_{DS} = -15V, V_{GS} = 0V$
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 -0.7	-1.4 -1.0	—	V	$V_{DS} = V_{GS}, I_D = -250 \mu A$
Static Drain-Source On-Resistance $T_j = 125^\circ C$	$R_{DS(ON)}$	—	0.038 0.054 0.046 0.064	0.05 0.10 0.07 0.09	$\Omega$	$V_{GS} = -10V, I_D = -5.3A$ $V_{GS} = -10V, I_D = -5.3A$ $V_{GS} = -6.0V, I_D = -4.7A$ $V_{GS} = -4.5V, I_D = -4.2A$
On-State Drain Current	$I_{D(ON)}$	-20 -5.0	—	—	A	$V_{GS} = -10V, V_{DS} = -5.0V$ $V_{GS} = -4.5V, V_{DS} = -5.0V$
Forward Transconductance	$g_{FS}$	—	10	—	m	$V_{DS} = -15V, I_D = -5.3A$
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	$C_{ISS}$	—	950	—	pF	$V_{DS} = -15V, V_{GS} = 0V$ $f = 1.0MHz$
Output Capacitance	$C_{OSS}$	—	610	—	pF	
Reverse Transfer Capacitance	$C_{RSS}$	—	220	—	pF	
<b>SWITCHING CHARACTERISTICS (Note 2)</b>						
Turn-On Delay Time	$t_{D(ON)}$	—	10	30	ns	$V_{DD} = -15V, I_D = -1.0A$ $V_{GEN} = -10V, R_{GEN} = 6.0\Omega$
Turn-On Rise Time	$t_r$	—	18	60	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	80	120	ns	
Turn-Off Fall Time	$t_f$	—	45	100	ns	
Total Gate Charge	$Q_g$	—	29	40	nC	$V_{DS} = -15V, I_D = -5.3A$ $V_{GS} = -10V$
Gate-Source Charge	$Q_{gs}$	—	3.0	—	nC	
Gate-Drain Charge	$Q_{gd}$	—	9.0	—	nC	
<b>DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS</b>						
Max Continuous Drain-Source Diode Forward Current	$I_S$	—	—	-1.9	A	
Drain-Source Diode Forward Voltage	$V_{SD}$	—	-0.85	-1.3	V	$V_{GS} = 0V, I_S = -5.3A$ (Note 2)
Reverse Recovery Time	$t_{rr}$	—	—	100	ns	$V_{GS} = 0V, I_F = -5.3A$ $di_F/dt = 100A/\mu s$

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

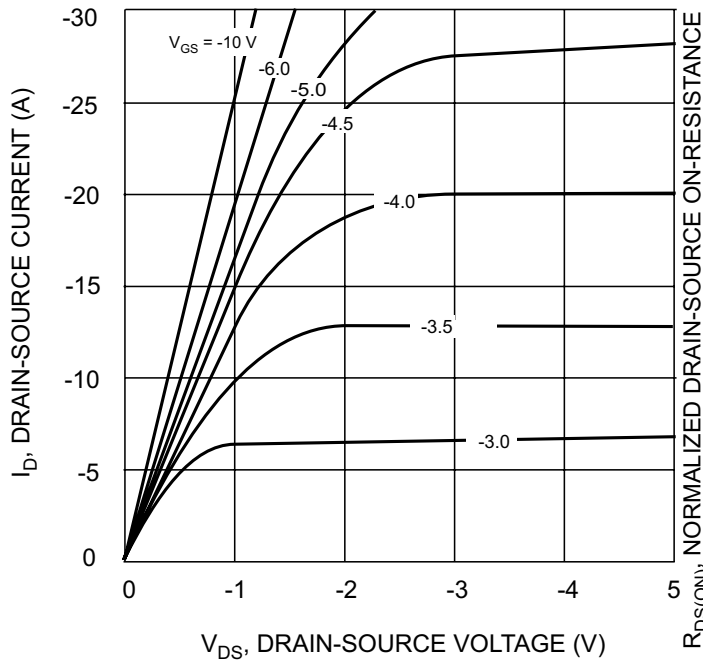


Fig. 1, On-Region Characteristics

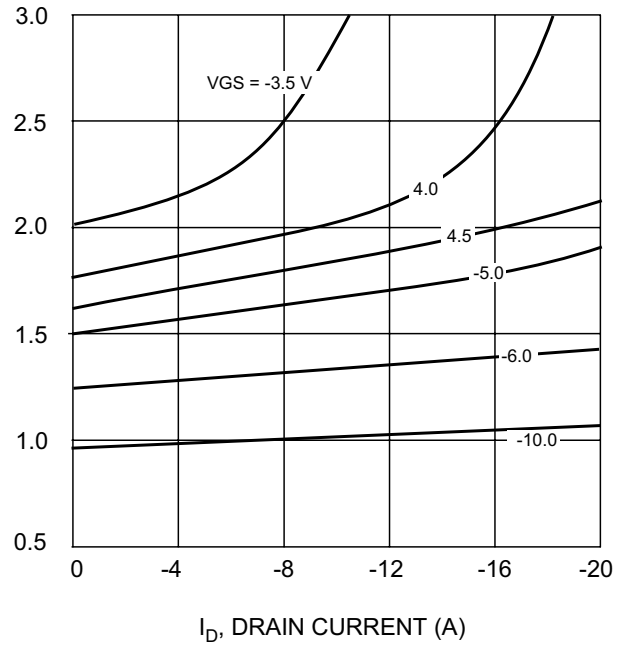


Fig. 2, On-Resistance vs. Gate Voltage & Drain Current

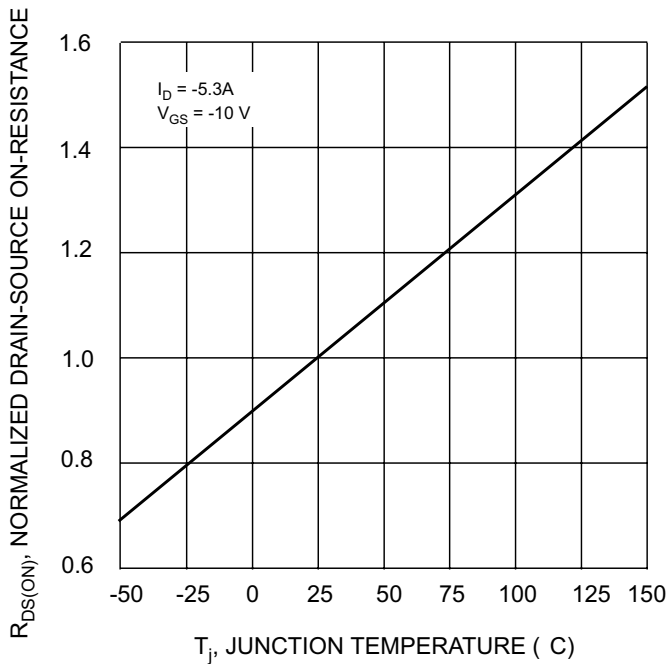


Fig. 3, On-Resistance vs. Junction Temperature

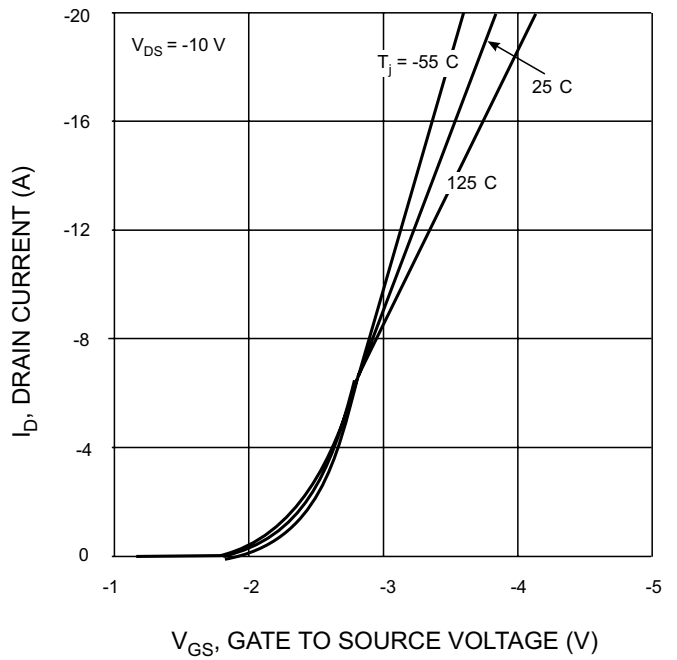
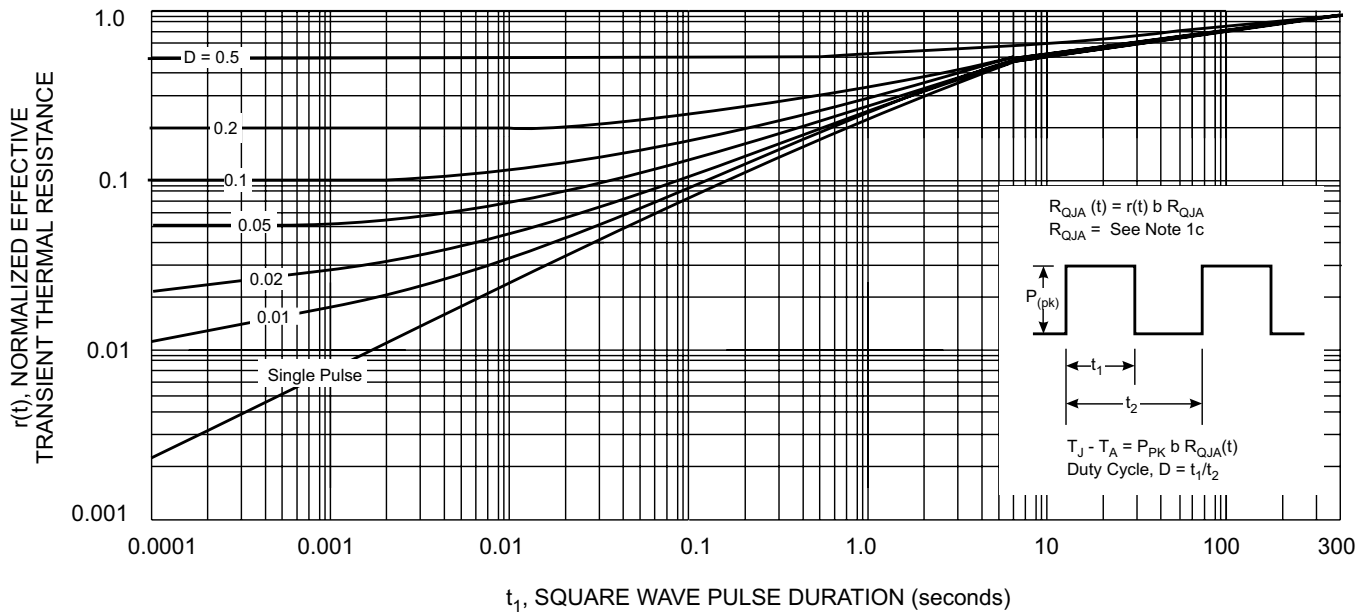
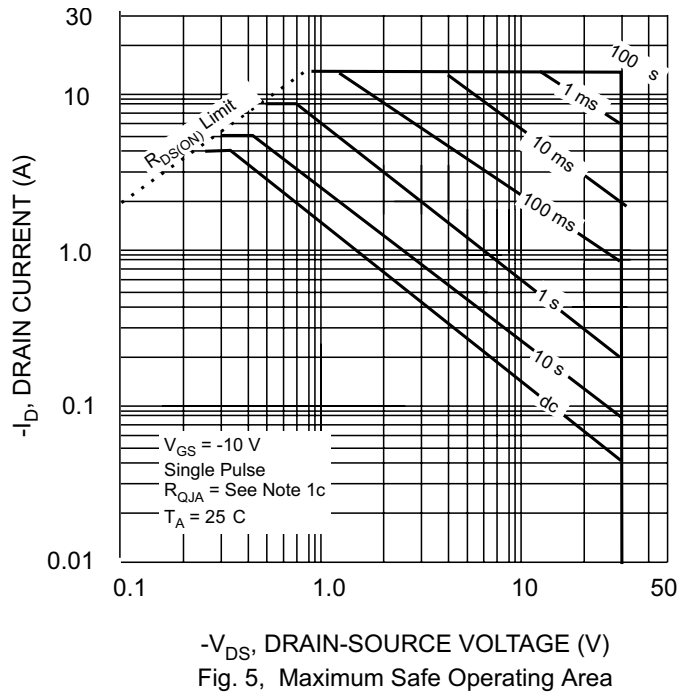


Fig. 4, Transfer Characteristics



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.