N-Channel 20-V (D-S) MOSFET

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low r_{DS(on)} and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

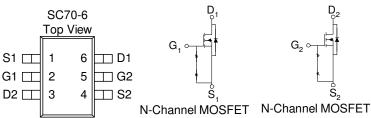
•	Low r _{DS(on)} provides higher efficiency and
	extends battery life

Low thermal impedance copper leadframe S1 ____ SC70-6 saves board space

Fast switching speed

High performance trench technology

PRODUCT SUMMARY					
$V_{DS}(V)$) $r_{DS(on)}(m\Omega)$ $I_D(A)$				
20	$88 @ V_{GS} = 4.5V$	1.6			
20	$120 @ V_{GS} = 2.5V$	1.3			



ESD Protected
2000V

ABSOLUTE MAXIMUM RATINGS (T	$C_A = 25$ $^{\circ}C$	UNLESS	OTHERWI	SE NOTED)		
Parameter			Symbol	Maximum	Units	
Drain-Source Voltage			V_{DS}	20	V	
Gate-Source Voltage			V_{GS}	8	V	
		T _A =25°	С	1.6		
Continuous Drain Current ^a		$T_A=25^{\circ}$	C	1.3	A	
Pulsed Drain Current ^b			I_{DM}	5		
Continuous Source Current (Diode	Conduct	ion) ^a	I_S	0.4	A	
_		T _A =25°	C	0.3	W	
Power Dissipation ^a		T _A =70°	$=25^{\circ}C$ $=70^{\circ}C$ P_D 0.3 0.21			
Operating Junction and Storage Ter	nperatur	e Range	T_J, T_{stg}	-55 to 150	°C	
THERMAL RESISTANCE RAT	INGS					
Parameter			Symbol	Maximum	Units	
M . T A 1a	t <=	5 sec	D	415	⁰ C/XX	

Steady-State

1

 $R_{THJA} \\$

Notes

Surface Mounted on 1" x 1" FR4 Board. a.

Maximum Junction-to-Ambient^a

b. Pulse width limited by maximum junction temperature 460

°C/W

SPECIFICATIONS (T _A = 25°C UNLESS OTHERWISE NOTED)							
Parameter	Symbol	Tool Conditions		Limits			
r ar ameter	Symbol	Test Conditions	Min	Тур	Max	Unit	
Static							
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_{D} = 250 \text{ uA}$	0.3			V	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 8 \text{ V}$			±25	uA	
Zero Gate Voltage Drain Current	ī	$V_{DS} = 16 \text{ V}, V_{CS} = 0 \text{ V}$			1	uA	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 16 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 55^{\circ}\text{C}$			5		
On-State Drain Current ^A	$I_{D(on)}$	$V_{DS} = 5 \text{ V}, V_{GS} = 4.5 \text{ V}$	2			A	
Davis Company A		$V_{GS} = 4.5 \text{ V}, I_D = 0.3 \text{ A}$			88	mΩ	
Drain-Source On-Resistance ^A	r _{DS(on)}	$V_{GS} = 2.5 \text{ V}, I_{D} = 0.2 \text{ A}$			120		
Forward Tranconductance ^A	${f g}_{ m fs}$	$V_{DS} = 4.5 \text{ V}, I_{D} = 0.3 \text{ A}$		8		S	
Diode Forward Voltage	V_{SD}	$I_S = 0.2 \text{ A}, V_{GS} = 0 \text{ V}$		1.1		V	
Dynamic ^b							
Total Gate Charge	Q_{g}			1			
Gate-Source Charge	Q_{gs}	$V_{DS} = 10 \text{ V}, V_{GS} = 5 \text{ V}, I_{D} = 0.3 \text{ A}$		0.4		nC	
Gate-Drain Charge	Q_{gd}			0.6			
Turn-On Delay Time	$t_{d(on)}$			7			
Rise Time	$t_{\rm r}$	$V_{DD} = 10 \text{ V}, R_L = 30 \Omega, \qquad I_D =$		14		ns	
Turn-Off Delay Time	$t_{d(off)}$	$0.3 \text{ A}, \text{ V}_{\text{GEN}} = 10 \text{ V}$		25		115	
Fall-Time	t_{f}			10			

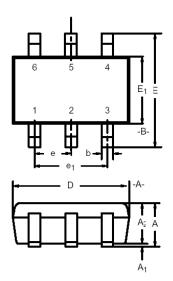
Notes

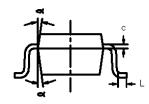
- a. Pulse test: $PW \le 300$ us duty cycle $\le 2\%$.
- b. Guaranteed by design, not subject to production testing.

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Package Information

SC-70: 6LEAD





	MILLIMETERS			INCHES			
Dim	Min	Nom	Max	Min	Nom	Max	
Α	0.90	_	1.10	0.035	_	0.043	
A ₁	_	_	0.10	_	_	0.004	
A ₂	0.80	_	1.00	0.031	_	0.039	
b	0.15	_	0.30	0.006	_	0.012	
С	0.10	_	0.25	0.004	_	0.010	
D	1.80	2.00	2.20	0.071	0.079	0.087	
E	1.80	2.10	2.40	0.071	0.083	0.094	
E ₁	1.15	1.25	1.35	0.045	0.049	0.053	
е	0.65BSC			0.026BSC			
e ₁	1.20	1.30	1.40	0.047	0.051	0.055	
L	0.10	0.20	0.30	0.004	0.008	0.012	
~	7°Nom			7°Nom			