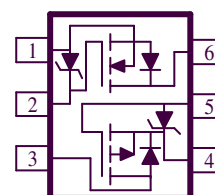
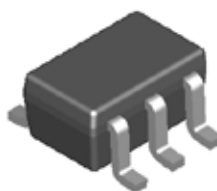


These miniature surface mount MOSFETs utilize a high cell density trench process to provide low  $r_{DS(on)}$  and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA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

- Low  $r_{DS(on)}$  provides higher efficiency and extends battery life
- Low thermal impedance copper leadframe SC70-6 saves board space
- Fast switching speed
- High performance trench technology



Protected



PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
40	140 @ $V_{GS} = 10V$	1.2
	190 @ $V_{GS} = 4.5V$	1.1
-20	300 @ $V_{GS} = -10V$	-0.9
	390 @ $V_{GS} = -4.5V$	-0.8

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ UNLESS OTHERWISE NOTED)					
Parameter	Symbol	N-Channel	P-Channel	Units	
Drain-Source Voltage	$V_{DS}$	40	-40	V	
Gate-Source Voltage	$V_{GS}$	20	-20		
Continuous Drain Current <sup>a</sup>	$I_D$	$T_A=25^\circ C$	1.2	-0.9	A
		$T_A=70^\circ C$	1	-0.7	
Pulsed Drain Current <sup>b</sup>	$I_{DM}$	1.2	-1.2		
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	0.25	-0.25	A	
Power Dissipation <sup>a</sup>	$P_D$	$T_A=25^\circ C$	0.3	0.3	W
		$T_A=70^\circ C$	0.21	0.21	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150		$^\circ C$	

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	Maximum	Units	
Maximum Junction-to-Ambient <sup>a</sup>	$R_{THJA}$	t <= 5 sec	415	$^\circ C/W$
		Steady-State	460	

Notes

- a. Surface Mounted on 1" x 1" FR4 Board.
- b. Pulse width limited by maximum junction temperature

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu A$ <b>(N-ch)</b>	1			V
		$V_{DS} = V_{GS}, I_D = -250 \mu A$ <b>(P-ch)</b>	-1			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			$\pm 10$	$\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 32 V, V_{GS} = 0 V$ <b>(N-ch)</b>			1	$\mu A$
		$V_{DS} = -32 V, V_{GS} = 0 V$ <b>(P-ch)</b>			-1	
On-State Drain Current	$I_{D(on)}$	$V_{DS} = 5 V, V_{GS} = 4.5 V$ <b>(N-ch)</b>	1.5			A
		$V_{DS} = -5 V, V_{GS} = -4.5 V$ <b>(P-ch)</b>	-1.5			A
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = 10 V, I_D = 1.2 A$ <b>(N-ch)</b>			140	$m\Omega$
		$V_{GS} = 4.5 V, I_D = 0.96 A$ <b>(N-ch)</b>			190	
		$V_{GS} = -10 V, I_D = -0.8 A$ <b>(P-ch)</b>			300	$m\Omega$
		$V_{GS} = -4.5 V, I_D = -0.64 A$ <b>(P-ch)</b>			390	
Forward Transconductance	$g_{fs}$	$V_{DS} = 10 V, I_D = 1.2 A$ <b>(N-ch)</b>		3		S
		$V_{DS} = -10 V, I_D = -0.8 A$ <b>(P-ch)</b>		5		S
Diode Forward Voltage	$V_{SD}$	$I_S = 0.2 A, V_{GS} = 0 V$ <b>(N-ch)</b>		0.65		V
		$I_S = -1.2 A, V_{GS} = 0 V$ <b>(P-ch)</b>		-0.66		V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	N - Channel $V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 1.2 A$		5		nC
Gate-Source Charge	$Q_{gs}$		0.3			
Gate-Drain Charge	$Q_{gd}$		0.7			
Turn-On Delay Time	$t_{d(on)}$	N - Channel $V_{DD} = 10 V, R_L = 8.3 \Omega,$ $I_D = 1.2 A,$ $V_{GEN} = 4.5 V, R_{GEN} = 6 \Omega$		8		ns
Rise Time	$t_r$		13			
Turn-Off Delay Time	$t_{d(off)}$		25			
Fall Time	$t_f$		8			
Input Capacitance	$C_{iss}$		73			
Output Capacitance	$C_{oss}$	N - Channel $V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz$		25		pF
Reverse Transfer Capacitance	$C_{rss}$		20			
Total Gate Charge	$Q_g$		4			
Gate-Source Charge	$Q_{gs}$	P - Channel $V_{DS} = -10 V, V_{GS} = 4.5 V, I_D = -0.8 A$		0.5		nC
Gate-Drain Charge	$Q_{gd}$		0.9			
Turn-On Delay Time	$t_{d(on)}$		8			
Rise Time	$t_r$	P - Channel $V_{DD} = -10 V, R_L = 12.5 \Omega,$ $I_D = -0.8 A,$ $V_{GEN} = -4.5 V, R_{GEN} = 6 \Omega$		10		ns
Turn-Off Delay Time	$t_{d(off)}$		28			
Fall Time	$t_f$		13			
Input Capacitance	$C_{iss}$		120			
Output Capacitance	$C_{oss}$	P - Channel $V_{DS} = -15 V, V_{GS} = 0 V, f = 1 MHz$		28		pF
Reverse Transfer Capacitance	$C_{rss}$		25			

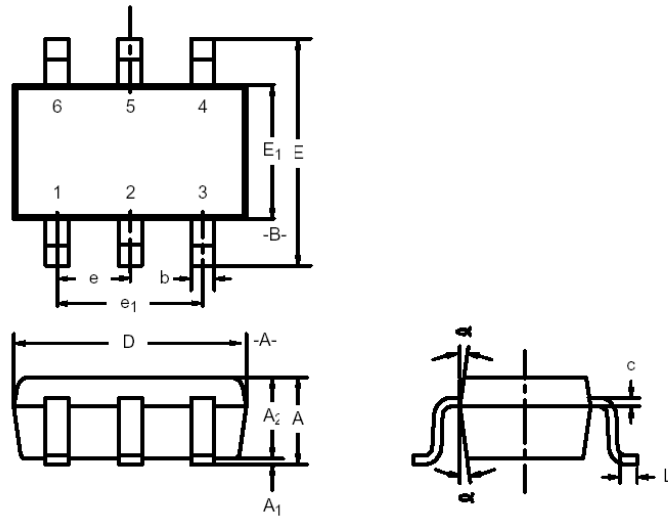
### Notes

- Pulse test:  $PW \leq 300\mu s$  duty cycle  $\leq 2\%$ .
- Guaranteed by design, not subject to production testing.

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Package Information

SC-70: 6LEAD



Dim	MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max
A	0.90	–	1.10	0.035	–	0.043
A <sub>1</sub>	–	–	0.10	–	–	0.004
A <sub>2</sub>	0.80	–	1.00	0.031	–	0.039
b	0.15	–	0.30	0.006	–	0.012
c	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 <sub>1</sub>	1.15	1.25	1.35	0.045	0.049	0.053
e	0.65BSC			0.026BSC		
e <sub>1</sub>	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
α	7°Nom			7°Nom		