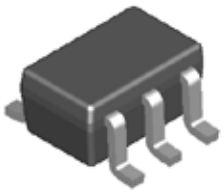
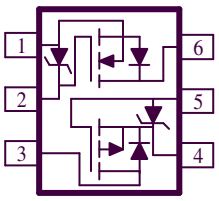
These miniature surface mount MOSFETs utilize a high cell density trench process to provide low $r_{DS(on)}$ and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA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

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	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

- 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

ESD Protected





ABSOLUTE MAXIMUM RATINGS (T_A = 25 °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[a]	T_A=25°C	I_D	1.2	-0.9	A
	T_A=70°C		1	-0.7	
Pulsed Drain Current[b]		I_{DM}	1.2	-1.2	
Continuous Source Current (Diode Conduction)[a]		I_S	0.25	-0.25	A
Power Dissipation[a]	T_A=25°C	P_D	0.3	0.3	W
	T_A=70°C		0.21	0.21	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150		°C

THERMAL RESISTANCE RATINGS				
Parameter		**Symbol**	**Maximum**	**Units**
Maximum Junction-to-Ambient[a]	t <= 5 sec	R_{THJA}	415	°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
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 uA **(N-ch)**	1			V
		V_{DS} = V_{GS}, I_D = -250 uA **(P-ch)**	-1			V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±10	uA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 32 V, V_{GS} = 0 V **(N-ch)**			1	uA
		V_{DS} = -32 V, V_{GS} = 0 V **(P-ch)**			-1	
On-State Drain Current	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 4.5 V **(N-ch)**	1.5			A
		V_{DS} = -5 V, V_{GS} = -4.5 V **(P-ch)**	-1.5			A
Drain-Source On-Resistance	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 1.2 A **(N-ch)**			140	mΩ
		V_{GS} = 4.5 V, I_D = 0.96 A **(N-ch)**			190	
		V_{GS} = -10 V, I_D = -0.8 A **(P-ch)**			300	mΩ
		V_{GS} = -4.5 V, I_D = -0.64 A **(P-ch)**			390	
Forward Transconductance	g_{fs}	V_{DS} = 10 V, I_D = 1.2 A **(N-ch)**		3		S
		V_{DS} = -10 V, I_D = -0.8 A **(P-ch)**		5		S
Diode Forward Voltage	V_{SD}	I_S = 0.2 A, V_{GS} = 0 V **(N-ch)**		0.65		V
		I_S = -1.2 A, V_{GS} = 0 V **(P-ch)**		-0.66		V
Dynamic						
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 Ω, I_D = 1.2 A, V_{GEN} = 4.5 V, R_{GEN} = 6 Ω		8		ns
Rise Time	t_r			13		
Turn-Off Delay Time	$t_{d(off)}$			25		
Fall Time	t_f			8		
Input Capacitance	C_{iss}	N - Channel V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz		73		pF
Output Capacitance	C_{oss}			25		
Reverse Transfer Capacitance	C_{rss}			20		
Total Gate Charge	Q_g	P - Channel V_{DS} = -10 V, V_{GS} = 4.5 V, I_D = -0.8 A		4		nC
Gate-Source Charge	Q_{gs}			0.5		
Gate-Drain Charge	Q_{gd}			0.9		
Turn-On Delay Time	$t_{d(on)}$	P - Channel V_{DD} = -10 V, R_L = 12.5 Ω, I_D = -0.8 A, V_{GEN} = -4.5 V, R_{GEN} = 6 Ω		8		ns
Rise Time	t_r			10		
Turn-Off Delay Time	$t_{d(off)}$			28		
Fall Time	t_f			13		
Input Capacitance	C_{iss}	P - Channel V_{DS} = -15 V, V_{GS} = 0 V, f = 1 MHz		120		pF
Output Capacitance	C_{oss}			28		
Reverse Transfer Capacitance	C_{rss}			25		

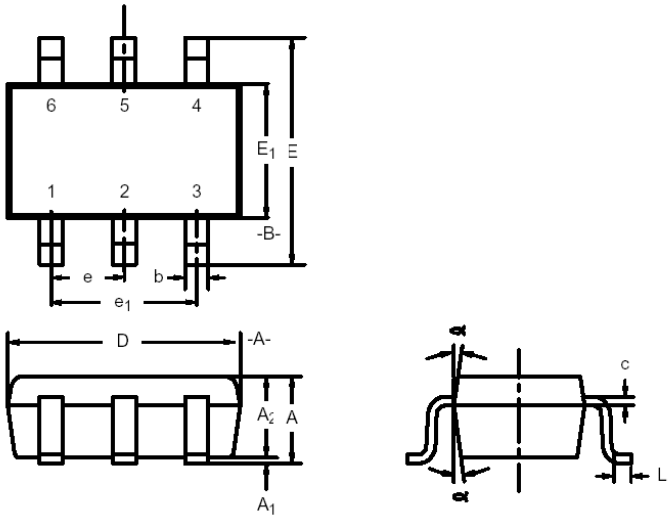
Notes

a. Pulse test: PW <= 300us duty cycle <= 2%.

b. Guaranteed by design, not subject to production testing.

Package Information

SC-70: 6LEAD



Dim	MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max
A	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
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_1	1.15	1.25	1.35	0.045	0.049	0.053
e	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
α	7°Nom			7°Nom		