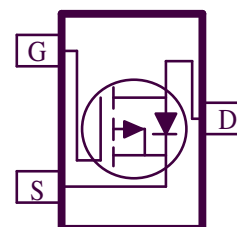
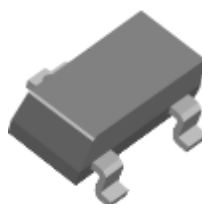


### P-Channel 30-V (D-S) MOSFET

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 SC70-3 saves board space
- Fast switching speed
- High performance trench technology

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ (OHM)	$I_D$ (A)
-30	0.112 @ $V_{GS} = -10V$	-1.5
	0.172 @ $V_{GS} = -4.5V$	-1.2



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Maximum	Units
Drain-Source Voltage		$V_{DS}$	-30	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	
Continuous Drain Current <sup>a</sup>	$T_A = 25^\circ C$	$I_D$	-1.5	A
	$T_A = 70^\circ C$		-1.2	
Pulsed Drain Current <sup>b</sup>		$I_{DM}$	-2.5	
Continuous Source Current (Diode Conduction) <sup>a</sup>		$I_S$	$\pm 0.28$	A
Power Dissipation <sup>a</sup>	$T_A = 25^\circ C$	$P_D$	0.34	W
	$T_A = 70^\circ C$		0.22	
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>	$t \leq 5$ sec	$R_{THJA}$	375	$^\circ C/W$
	Steady-State		430	

Notes

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

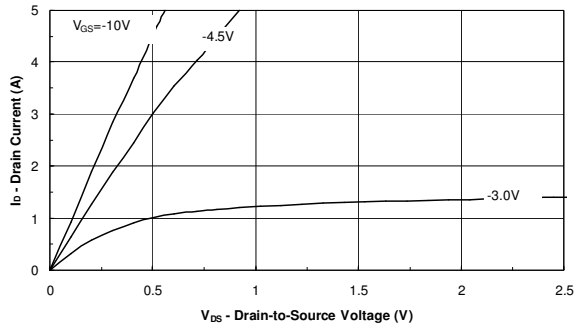
SPECIFICATIONS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
<b>Static</b>						
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	-1			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 20\ \text{V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -24\ \text{V}, V_{GS} = 0\ \text{V}$			-1	uA
		$V_{DS} = -24\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 55^\circ\text{C}$			-10	
On-State Drain Current <sup>A</sup>	$I_{D(on)}$	$V_{DS} = -5\ \text{V}, V_{GS} = -10\ \text{V}$	-5			A
Drain-Source On-Resistance <sup>A</sup>	$r_{DS(on)}$	$V_{GS} = -10\ \text{V}, I_D = -1.5\ \text{A}$			112	nΩ
		$V_{GS} = -4.5\ \text{V}, I_D = -1.2\ \text{A}$			172	
Forward Transconductance <sup>A</sup>	$g_s$	$V_{DS} = -5\ \text{V}, I_D = -1.5\ \text{A}$		9		S
Diode Forward Voltage	$V_{SD}$	$I_S = -0.46\ \text{A}, V_{GS} = 0\ \text{V}$		-0.65		V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = -10\ \text{V}, V_{GS} = -5\ \text{V}, I_D = -1.5\ \text{A}$		7.2		nC
Gate-Source Charge	$Q_{gs}$			1.7		
Gate-Drain Charge	$Q_{gd}$			1.5		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -10\ \text{V}, I_L = -1\ \text{A}, V_{GEN} = -4.5\ \text{V}, R_G = 6\ \Omega$		10		ns
Rise Time	$t_r$			9		
Turn-Off Delay Time	$t_{d(off)}$			27		
Fall-Time	$t_f$			11		

Notes

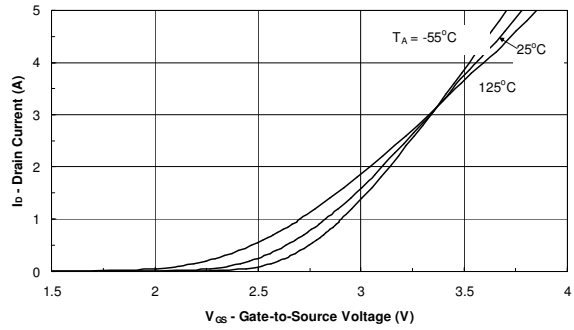
- a. Pulse test:  $PW \leq 300\ \mu\text{s}$  duty cycle  $\leq 2\%$ .
- b. Guaranteed by design, not subject to production testing.
- c. Repetitive rating, pulse width limited by junction temperature.

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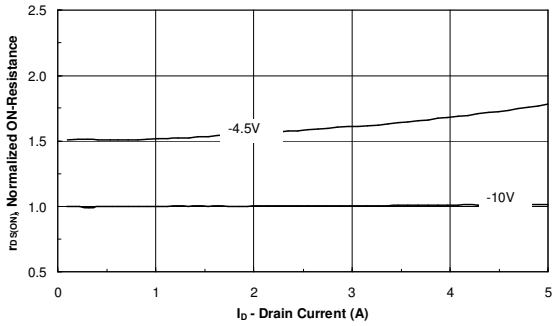
Typical Electrical Characteristics (P-Channel)



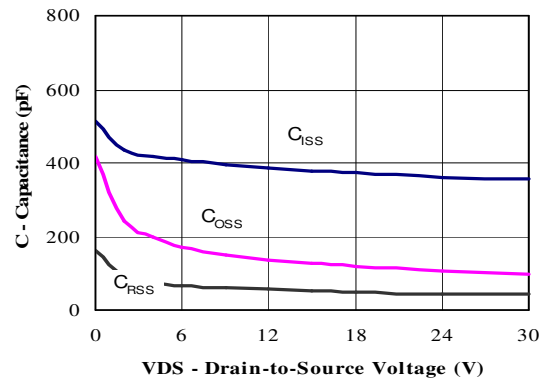
Output Characteristics



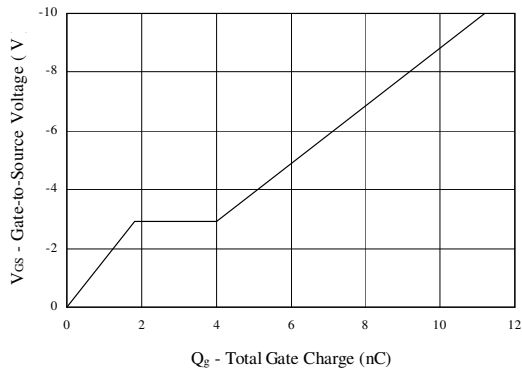
Transfer Characteristics



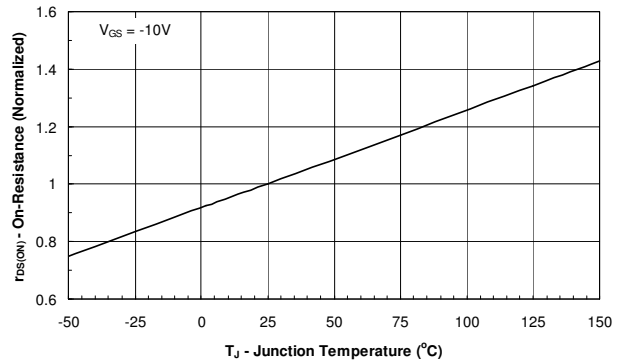
On-Resistance vs. Drain Current



Capacitance

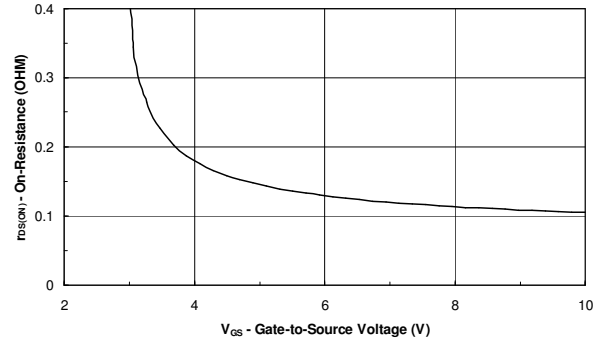
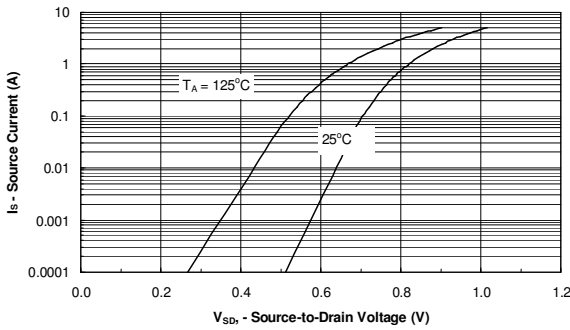


Gate Charge

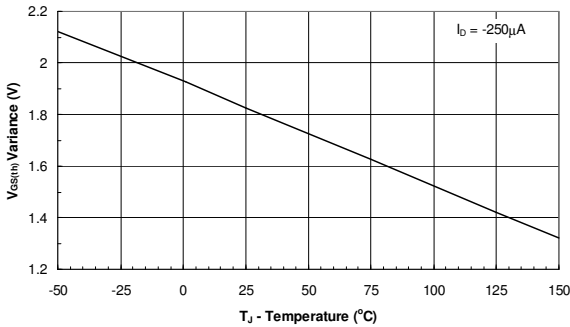


On-Resistance vs. Junction Temperature

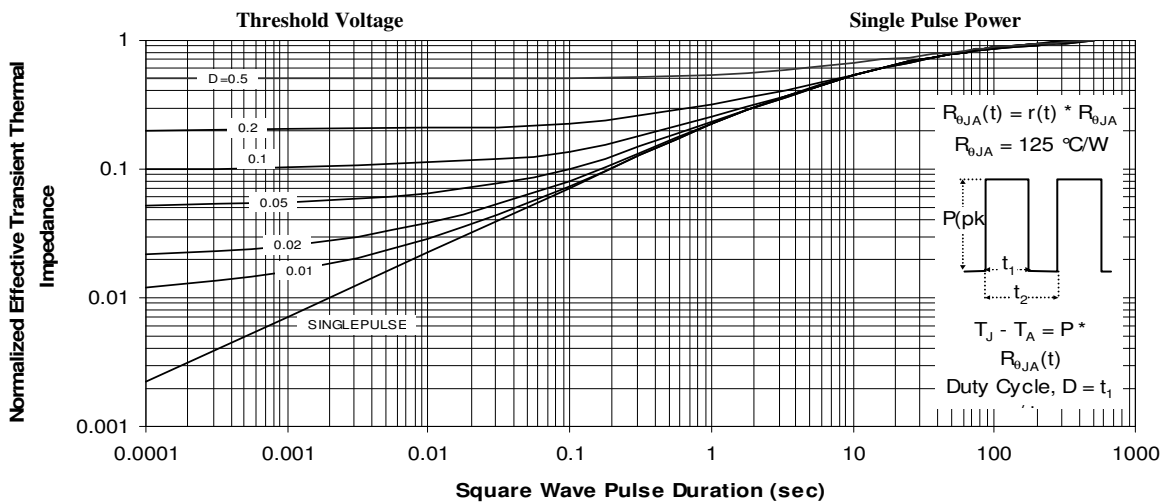
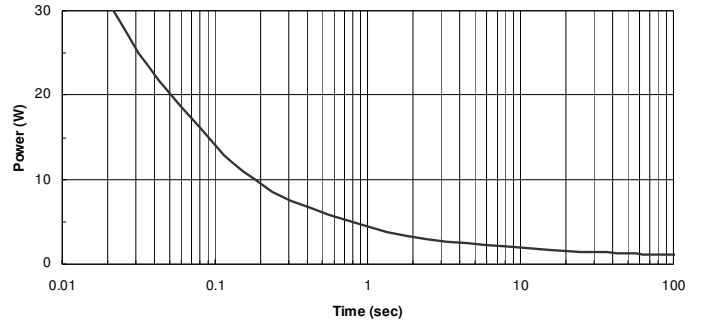
Typical Electrical Characteristics (P-Channel)



Source-Drain Diode Forward Voltage



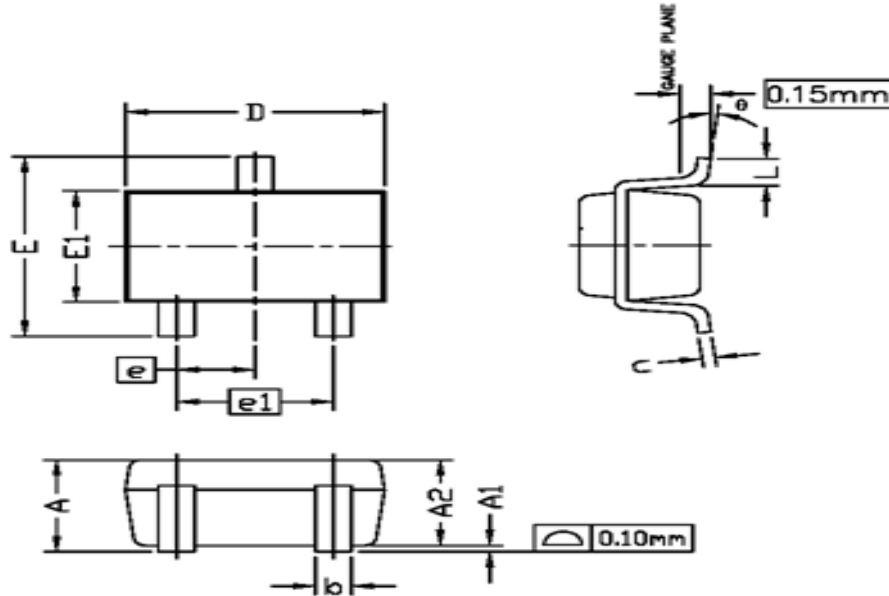
On-Resistance vs. Gate-to Source Voltage



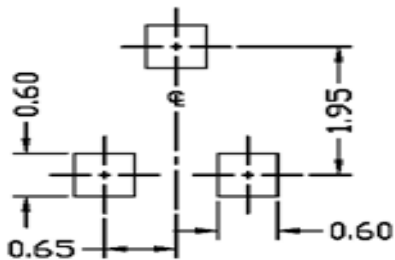
Normalized Thermal Transient Impedance, Junction-to-Ambient

# Package Information

## SC70 PACKAGE OUTLINE



### RECOMMENDED LAND PATTERN



UNIT: mm

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A			1.10			0.043
A1	0.00		0.10	0.00		0.004
A2	0.7	0.9	1.00	0.028	0.035	0.039
b	0.15		0.30	0.006		0.012
c	0.08		0.22	0.003		0.009
D	1.85	2.10	2.15	0.073	0.083	0.085
E	1.80	2.30	2.40	0.071	0.091	0.094
e	0.65 BSC			0.026 BSC		
e1	1.30 BSC			0.051 BSC		
E1	1.1	1.30	1.4	0.043	0.051	0.055
L	0.26	0.36	0.46	0.010	0.014	0.018
θ	0°	4°	8°	0°	4°	8°

### NOTE

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONS ARE INCLUSIVE OF PLATING.
3. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.  
MOLD FLASH AT THE NON-LEAD SIDES SHOULD BE LESS THAN 3 MILS EACH.
4. DIE IS FACING UP FOR MOLD AND FACING DOWN FOR TRIM/FORM.  
ie: REVERSE TRIM/FORM.
5. DIMENSION L IS MEASURED IN GAUGE PLANE.
6. CONTROLLING DIMENSION IS MILLIMETER.  
CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.