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

■ FEATURES

- Low $R_{DS(on)}$ Provides Higher Efficiency and Extends Battery Life
- High power and current handling capability
- Miniature SOP-8 Surface Mount Package Saves Board Space

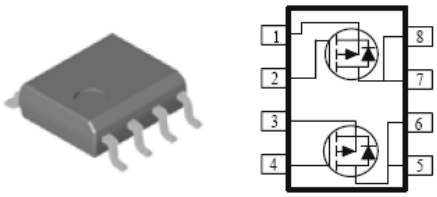
■ Product Summary

MOSFET		
V_{DS}(V)	$R_{DS(on)}$ (mΩ)	I_D (A)
-30	60 @ VGS =-10V	-4.9
	90 @ VGS =-4.5V	-3.7

■ Description

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, and PCMCIA cards, cellular and cordless telephones.

■ SOP-8



Maximum Ratings (TA = 25 °C UNLESS OTHERWISE NOTED)

Symbol	Parameter		Maximum	Unit
V_{DS}	Drain-Source Voltage		-30	V
V_{GS}	Gate-Source Voltage		±20	
I_D	Continuous Drain Current [a]	T_A=25°C	±4.9	A
		T_A=70°C	±4.2	
I_{DM}	Pulsed Drain Current [b]		±30	
Is	Continuous Source Current (Diode Conduction)[a]		-1.6	A
P_D	Power Dissipation [a]	T_A=25°C	2.1	W
		T_A=70°C	1.3	
T_J, T_{stg}	Operation Junction and Storage Temperature Range		-55 to 150	°C

Thermal Resistance Ratings

Symbol	Parameter		Maximum	Unit
$R_{\theta JA}$	Maximum Junction-to-Ambient [a]	t <= 10 sec	60	°C/W
$R_{\theta JC}$	Maximum Junction-to-Case [a]	t <= 5 sec	40	°C/W

Notes:
(a) Surface Mounted on 1" x 1" FR4 Board.
(b) Pulse width limited by maximum junction temperature

Electrical Characteristics

SPECIFICATIONS (TA = 25°C UNLESS OTHERWISE NOTED)						
Parameter	**Symbol**	**Test Condition**	**Limits**			**Unit**
			Min	**Typ**	**Max**	
Static						
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250 uA	-1	-1.5	-3	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -24 V, V_{GS} = 0 V			-1	uA
		V_{DS} = -24 V, V_{GS} = 0 V, T_J = 55°C			-5	
On-State Drain Current [a]	$I_{D(on)}$	V_{DS} = -5V, V_{GS} =-10V	-30			A
Drain-Source On-Resistance [a]	$R_{DS(on)}$	V_{GS} = -10 V, I_D = -4.9 A		50	60	mΩ
		V_{GS} = -4.5 V, I_D = -3.7 A		75	90	
Forward Transconductance [a]	g_{fs}	V_{DS} = -15V, I_D = -4.9A		10		S
Diode Forward Voltage	V_{SD}	Is = -1.9 A, V_{GS} = 0 V			-1.3	V
Dynamic [b]						
Total Gate Charge	Q_g	V_{DS} = -15V, V_{GS} = -10V I_D = -5.2A		28		nC
Gate-Source Charge	Q_{gs}			3		
Gate-Drain Charge	Q_{gd}			7		
Input Capacitance	Ciss	V_{DS} = -15V, V_{GS} = 0V f=1MHz		745		pF
Output Capacitance	Coss			440		
Reverse Transfer Capacitance	Crss			120		
Switching						
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=-15V, R_L = 15Ω I_D = -1A, V_{GEN} = -10V, R_G = 6Ω		9		nS
Turn-On Rise Time	t_r			15		
Turn-Off Delay Time	$t_{d(off)}$			75		
Turn-Off Fall Time	t_f			40		

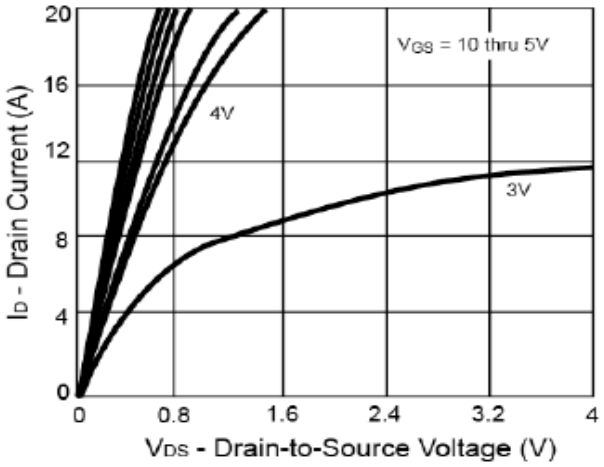
Notes:

(a) Pulse test: pulse width <= 300us, duty cycle<= 2%

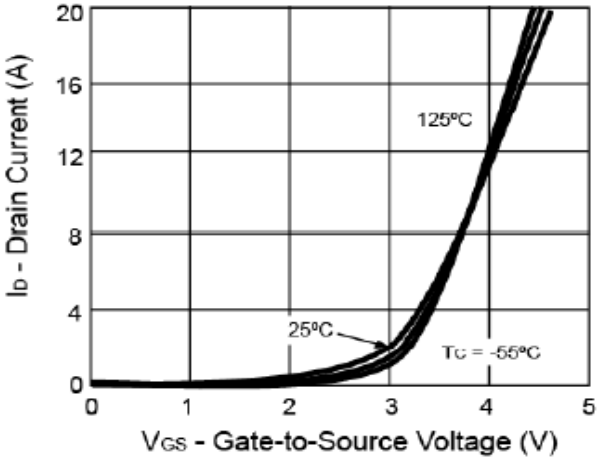
(b) Guaranteed by design; not subject to production testing

Typical Electrical Characteristics

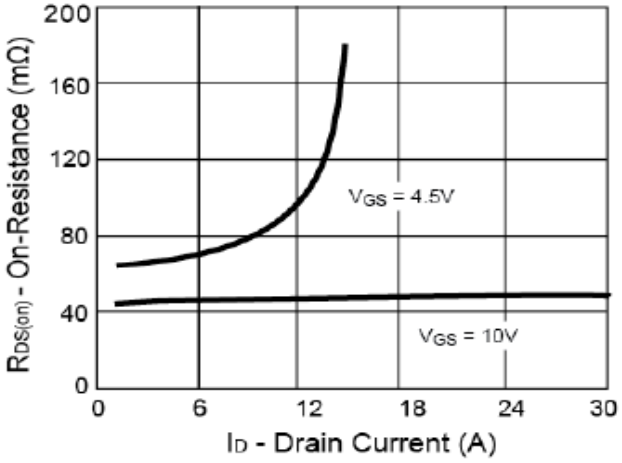
Output Characteristics



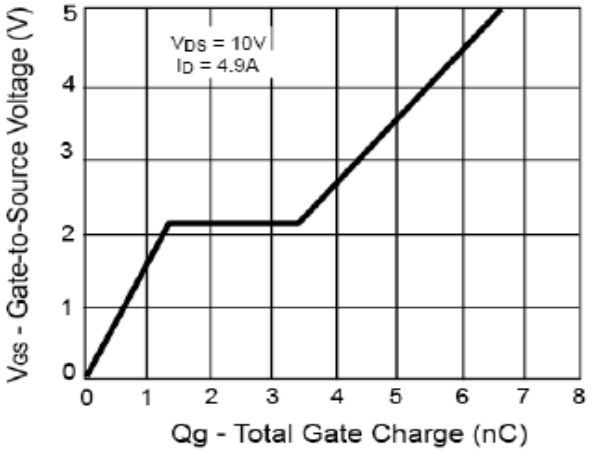
Transfer Characteristics



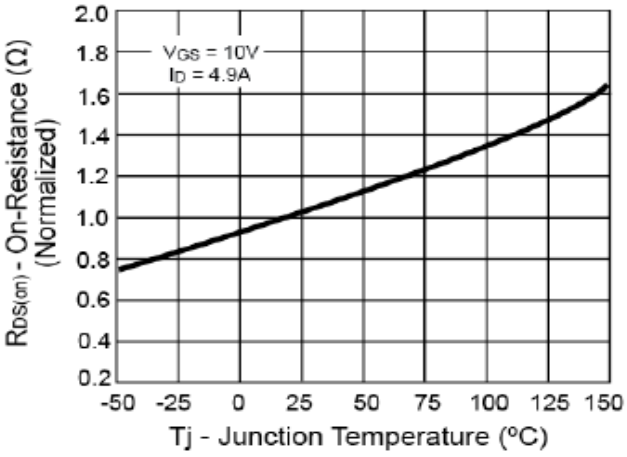
On-Resistance vs. Drain Current



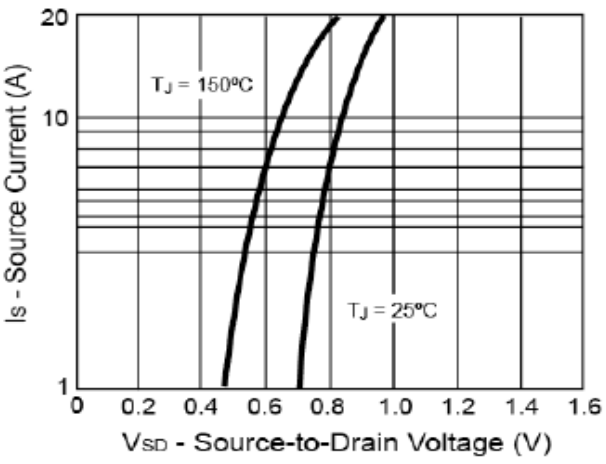
Gate Charge



On-Resistance vs. Junction Temperature

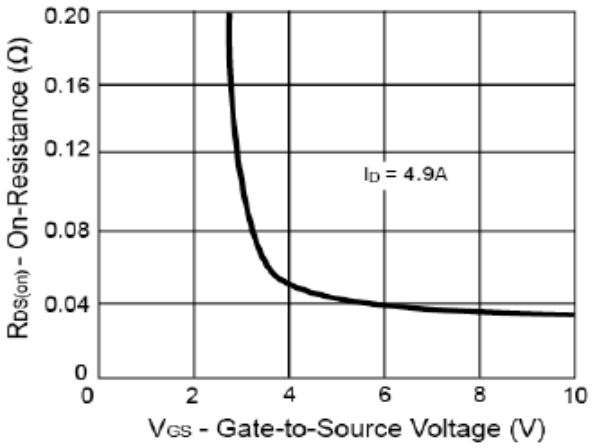


Source-Drain Diode Forward Voltage

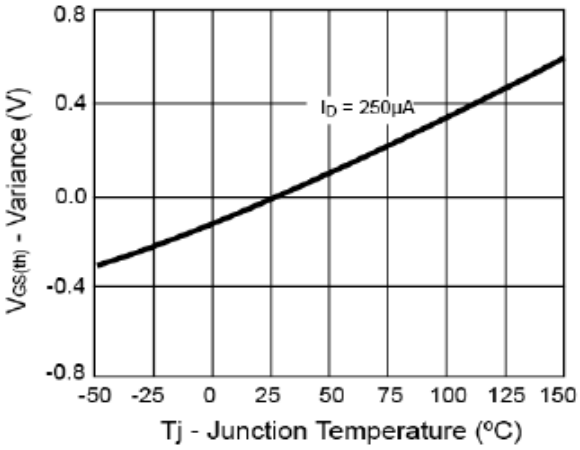


Typical Electrical Characteristics

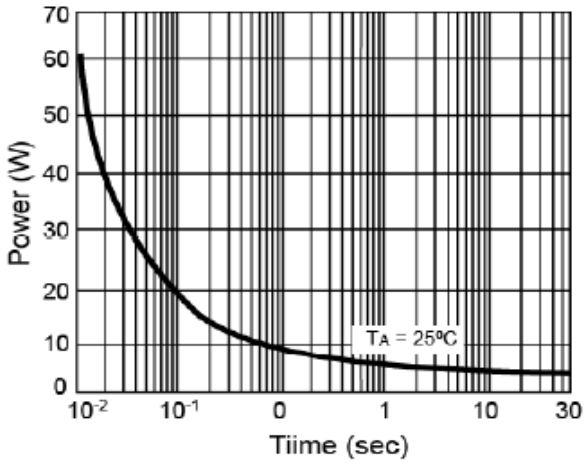
On-Resistance vs. Gate-Source Voltage



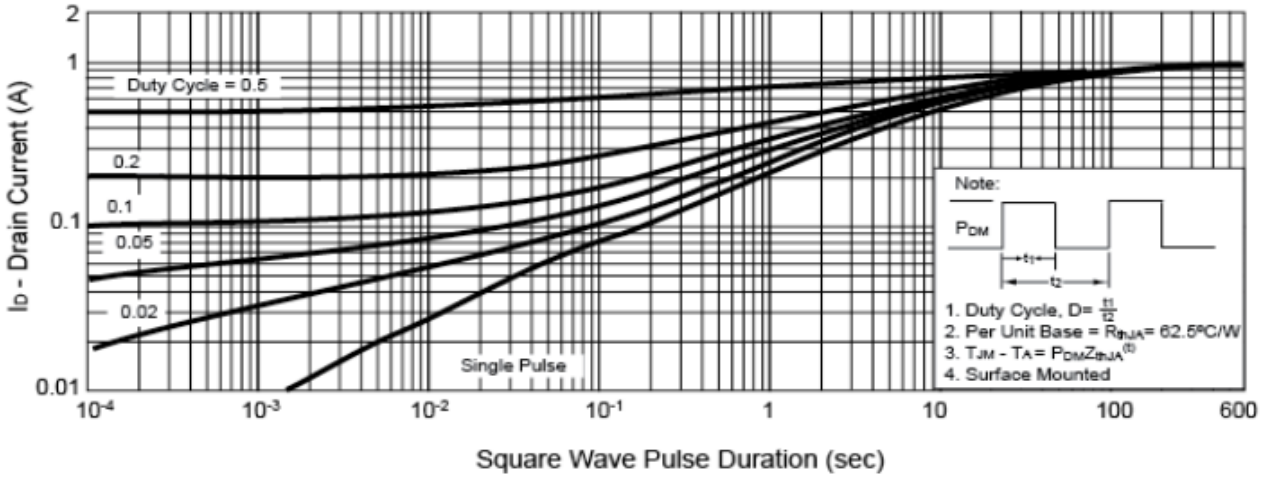
Threshold Voltage



Single Pulse Power

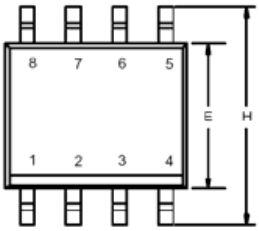


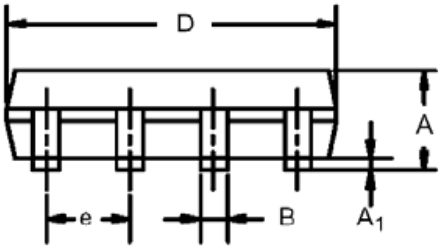
Normalized Thermal Transient Impedance, Junction-to-Ambient



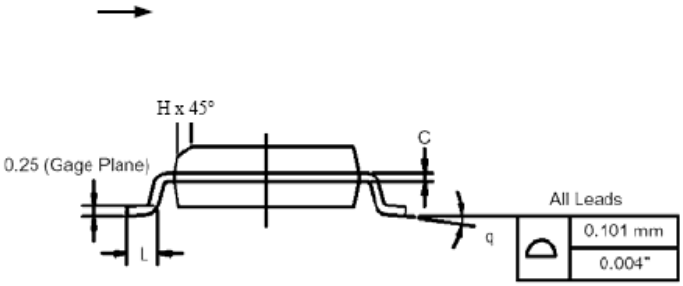
Package Information

SOP-8 : 8LEAD





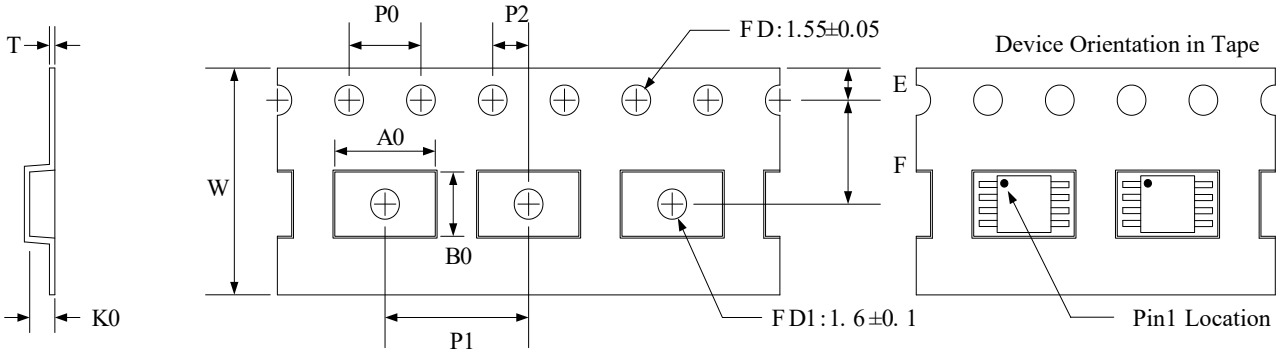
Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A_1	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.0075	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°



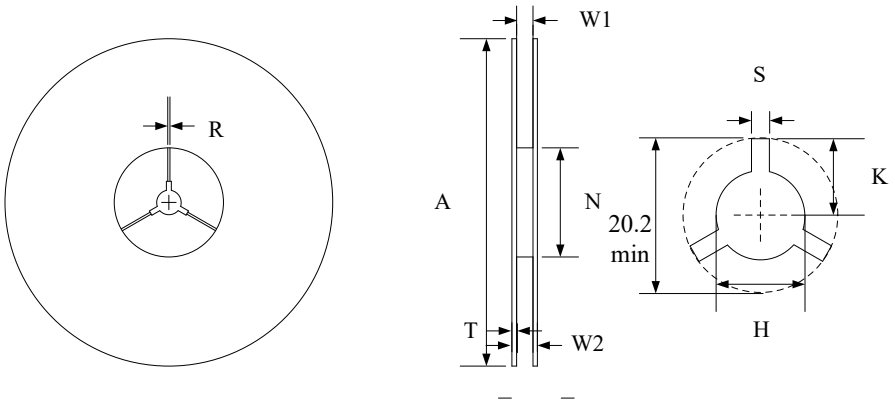
Ordering Information

Part Number	Working Voltage	Quantity Per Reel	Reel Size
4953	30 V	3,000	13 Inch

Tape and Reel Specification



Symbol	W	A0	B0	K0	E	F	P1	P0	P2	T
Dimensions (mm)	12.00±0.3	6.40±0.1	5.2±0.1	2.10±0.1	1.75±0.1	5.50±0.1	8.00±0.1	4.0±0.1	2.0±0.1	0.3±0.05



Symbol	Reel Size	A	N	W2	W1	H	T	S	K	R
Dimensions (mm)	Φ330	330.0±2.0	100.0±2.0	18.4 max	12.4+2.0 -0.0	13.0+0.5 -0.2	2.0±0.2	1.5 min	10.1 min	2.5 min