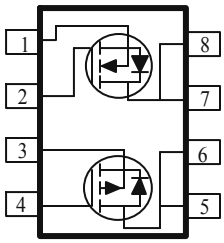
P & N-Channel 40-V (D-S) MOSFET

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.

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ m(Ω)	I_D (A)
40	27 @ V_{GS} = 4.5V	7.3
	22 @ V_{GS} = 10V	8.3
-40	40 @ V_{GS} = -4.5V	-6.2
	30 @ V_{GS} = -10V	-7.6

- Low $r_{DS(on)}$ provides higher efficiency and extends battery life
- Low thermal impedance copper leadframe SOIC-8 saves board space
- Fast switching speed
- High performance trench technology



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	8.3	-7.6	A
	T_A=70°C		6.8	-6.3	
Pulsed Drain Current[b]		I_{DM}	±50	±50	
Continuous Source Current (Diode Conduction)[a]		I_S	2.3	-2.1	A
Power Dissipation[a]	T_A=25°C	P_D	2.1	2.1	W
	T_A=70°C		1.3	1.3	
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 <= 10 sec	$R_{\theta JA}$	62.5	°C/W
	Steady-State		110	°C/W

Notes

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

b. Pulse width limited by maximum junction temperature

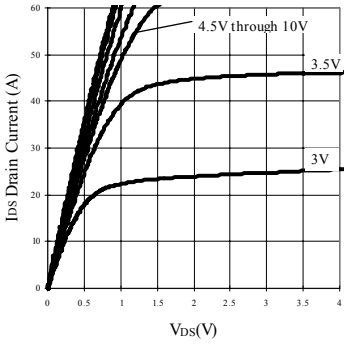
SPECIFICATIONS (T_A = 25°C UNLESS OTHERWISE NOTED)							
Parameter	**Symbol**	**Test Conditions**	**Limits**				**Unit**
			Ch	**Min**	**Typ**	**Max**	
Static							
Gate-Threshold Voltage	$V_{GS(th)}$	V_{GS} = V_{DS}, I_D = 250 uA	N	1	1.5	3	V
		V_{GS} = V_{DS}, I_D = -250 uA	P	-1	-1.4	-3	
Gate-Body Leakage	I_{GSS}	V_{GS} = -20 V, V_{DS} = 0 V	P		7	±100	nA
		V_{GS} = 20 V, V_{DS} = 0 V	N		6	±100	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -32 V, V_{GS} = 0 V	P		12nA	-1	uA
		V_{DS} = 32 V, V_{GS} = 0 V	N		2nA	1	
On-State Drain Current[A]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 10 V	N	25			A
		V_{DS} = -5 V, V_{GS} = -10 V	P	-50			
Drain-Source On-Resistance[A]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 8.3 A	N		14	22	mΩ
		V_{GS} = 4.5 V, I_D = 7.3 A			17	27	
		V_{GS} = -10 V, I_D = -7.6 A	P		28	30	
		V_{GS} = -4.5 V, I_D = -6.2 A			35	40	
Forward Tranconductance[A]	g_{fs}	V_{DS} = 15 V, I_D = 8.3 A	N		40		S
		V_{DS} = -15 V, I_D = -7.6 A	P		31		
Dynamic							
Total Gate Charge	Q_g	N-Channel V_{DS}=15V, V_{GS}=4.5V, I_D=8.3A P-Channel V_{DS}=-15V, V_{GS}=-4.5V, I_D=-7.6A	N		13	30	nC
			P		14	30	
Gate-Source Charge	Q_{gs}		N		3.3	7	
			P		5.8	12	
Gate-Drain Charge	Q_{gd}		N		4.5	10	
			P		12	30	
Input Capacitance	C_{iss}	N-Channel V_{DS}=15V, V_{GS}=0V, f=1MHz P-Channel V_{DS}=-15V, V_{GS}=0V, f=1MHz	N		1317	3000	pF
			P		1583	4000	
Output Capacitance	C_{oss}		N		272	600	
			P		278	600	
Reverse Transfer Capacitance	C_{rss}		N		169	400	
			P		183	400	
Turn-On Delay Time	$t_{d(on)}$	N-Chaneel V_{DD}=15V, V_{GS}=10V, I_D=1A , R_{GEN}=25Ω, P-Channel V_{DD}=-15V, V_{GS}=-10V, I_D=-1A R_{GEN}=15Ω	N		20	40	nS
			P		15	30	
Rise Time	t_r		N		9	20	
			P		16	40	
Turn-Off Delay Time	$t_{d(off)}$		N		70	200	
			P		62	200	
Fall-Time	t_f		N		20	40	
			P		46	100	

Notes

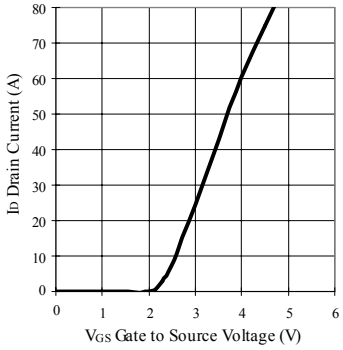
a. Pulse test: PW <= 300us duty cycle <= 2%.

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

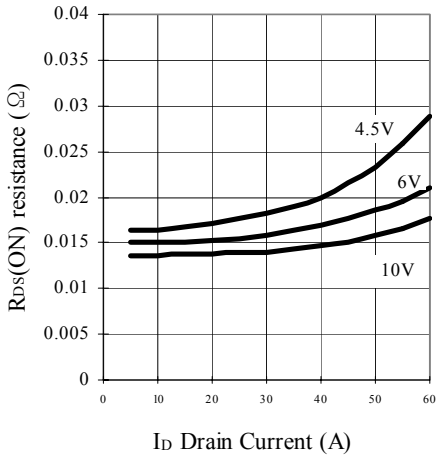
Typical Electrical Characteristics (N-Channel)



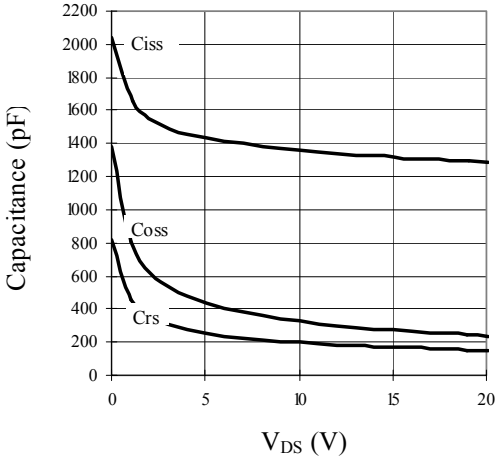
Output Characteristics



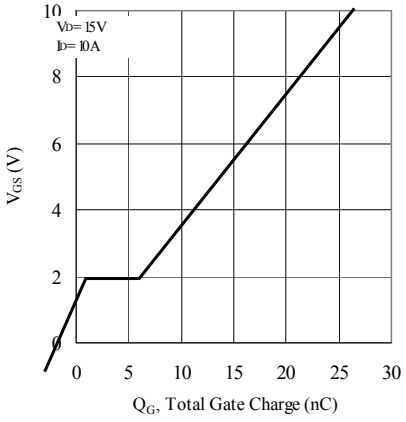
Transfer Characteristics



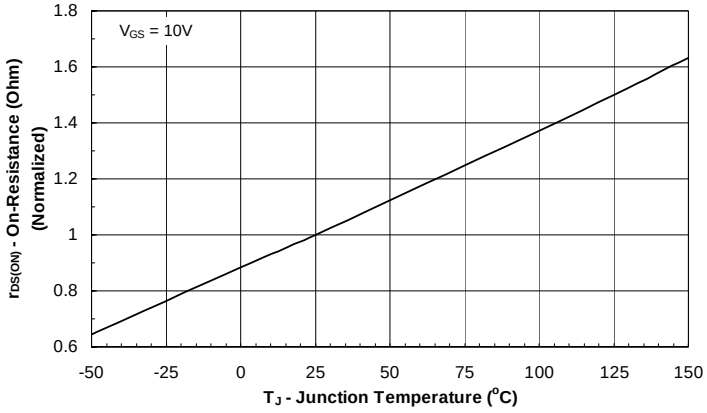
On Resistance vs. Drain Current



Capacitance

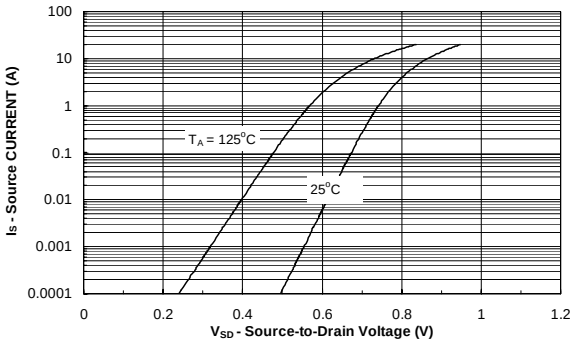


Gate Charge

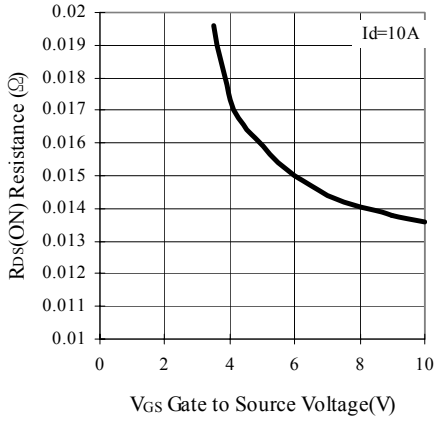


On-Resistance vs. Junction Temperature

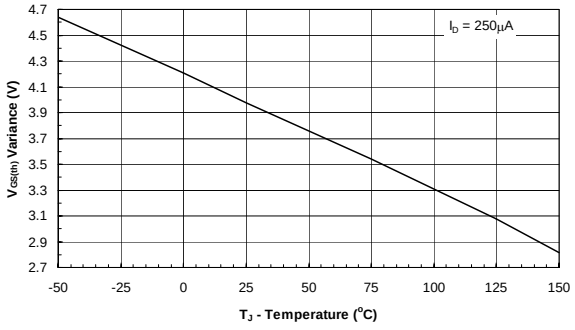
Typical Electrical Characteristics (N-Channel)



Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

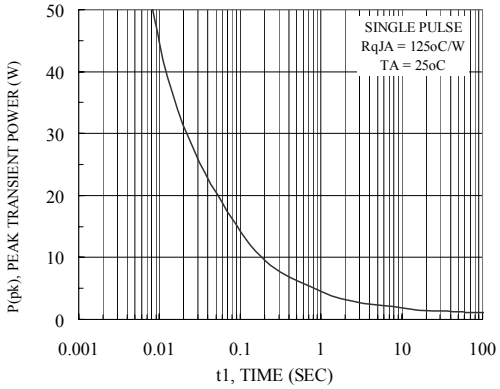


Figure 10. Single Pulse Maximum Power Dissipation

Normalized Thermal Transient Junction to Ambient

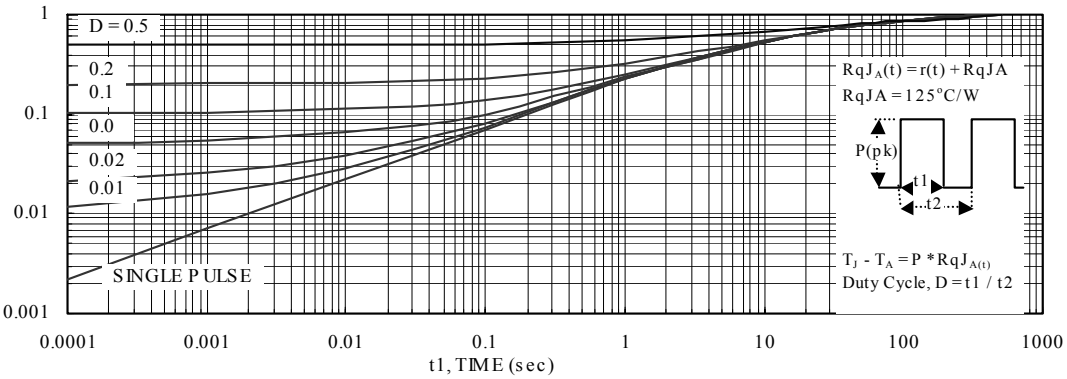
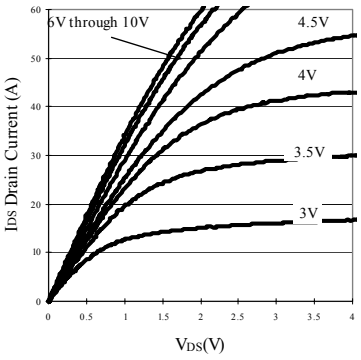
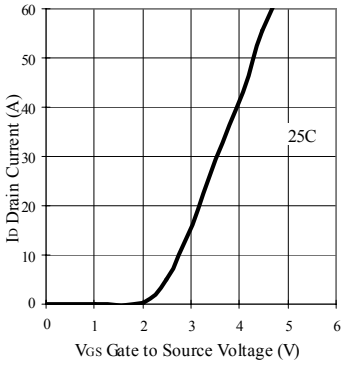


Figure 11. Transient Thermal Response Curve

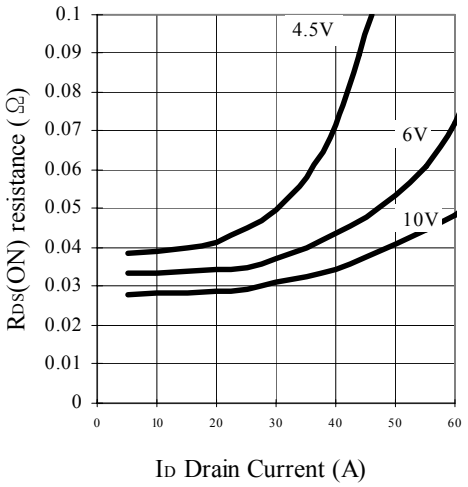
Typical Electrical Characteristics (P-Channel)



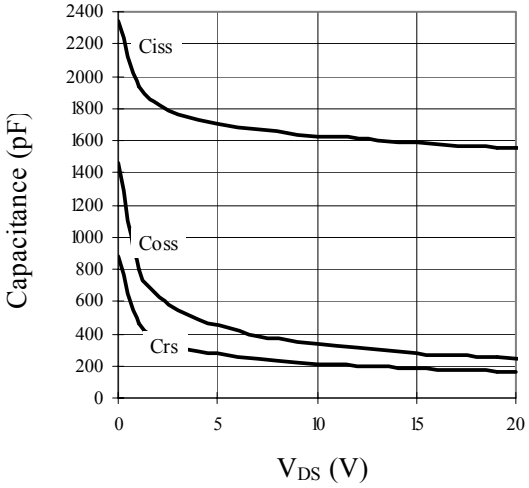
Output Characteristics



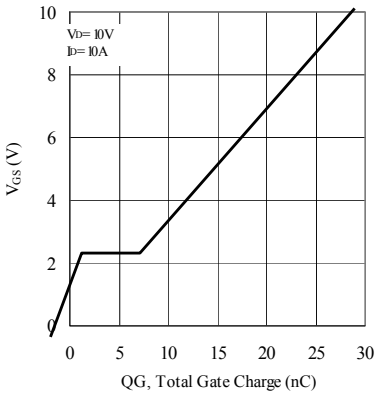
Transfer Characteristics



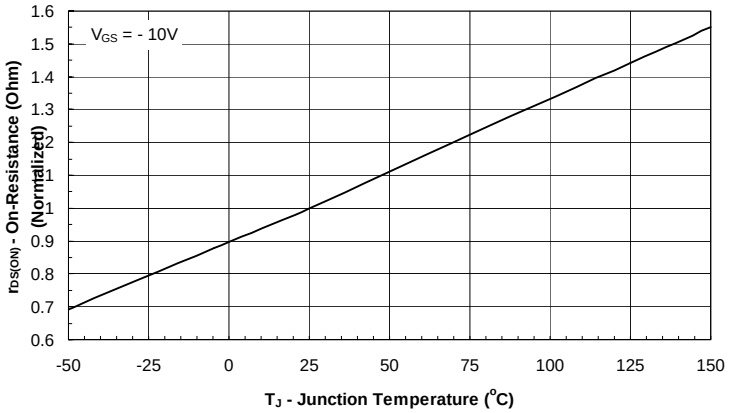
On Resistance Vs Vgs Voltage



Capacitance

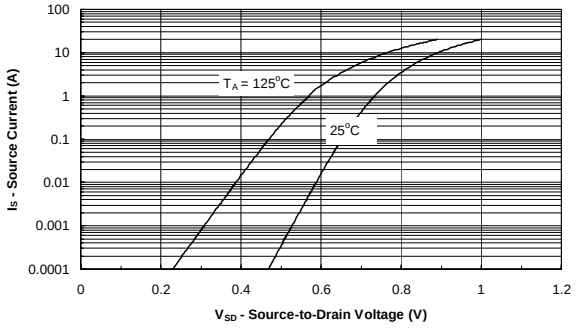


Gate Charge

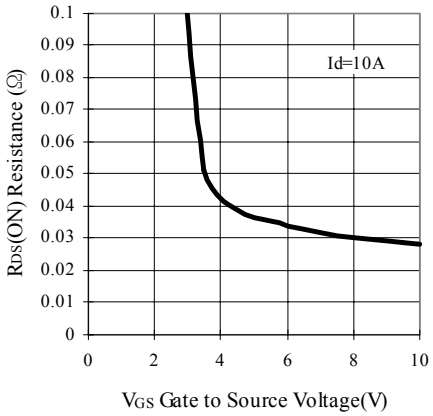


On-Resistance vs. Junction Temperature

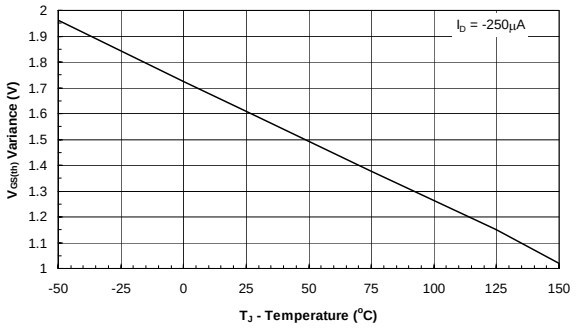
Typical Electrical Characteristics (P-Channel)



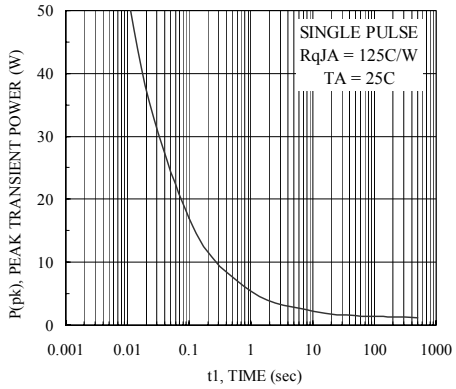
Source-Drain Diode Forward Voltage



On-Resistance with Gate to Source Voltage



Threshold Voltage



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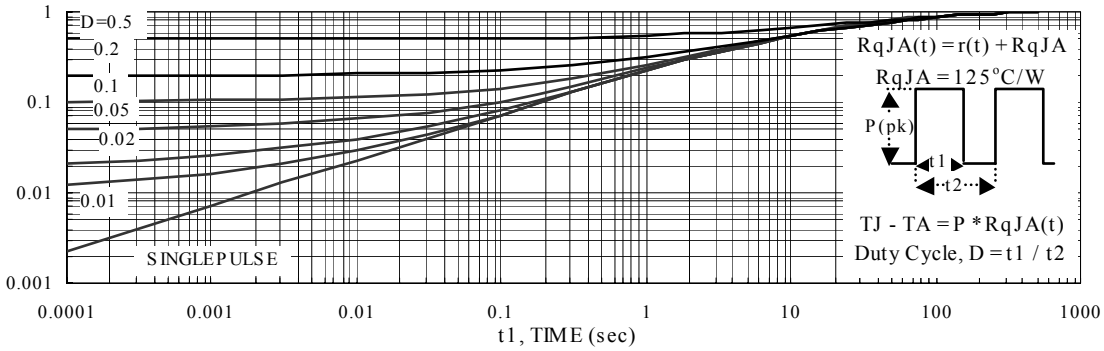
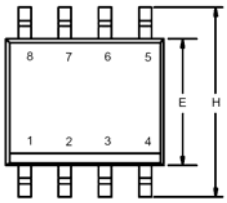
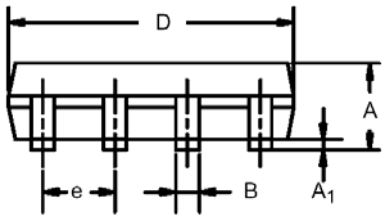


Figure 11. Transient Thermal Response Curve

Package Information

SO-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°