

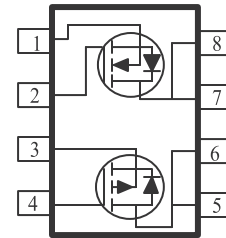
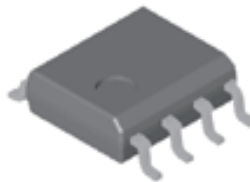
P & N-Channel 40-V (D-S) MOSFET

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 ($T_A = 25^\circ\text{C}$ 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	I_D	8.3	-7.6	A
		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	P_D	2.1	2.1	W
		1.3	1.3	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150		$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Maximum	Units
Maximum Junction-to-Ambient ^a	$t \leq 10 \text{ sec}$	62.5	$^\circ\text{C/W}$
	Steady-State	110	$^\circ\text{C/W}$

Notes

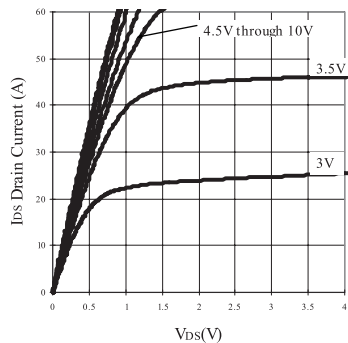
- Surface Mounted on 1" x 1" FR4 Board.
- Pulse width limited by maximum junction temperature

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
Gate-Source Charge	Q _{gs}		P		14	30	
			N		3.3	7	
Gate-Drain Charge	Q _{gd}		P		5.8	12	
		N		4.5	10		
Input Capacitance	C _{iss}	N-Channel V _{DS} =15V, V _{GS} =0V, f=1MHz P-Channel V _{DS} =-15V, V _{GS} =0V, f=1MHz	P		12	30	pF
			N		1317	3000	
P			1583	4000			
N			272	600			
Output Capacitance	C _{oss}		P		278	600	
N				169	400		
Reverse Transfer Capacitance	C _{rss}		P		183	400	
			N		20	40	
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	P		15	30	nS
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	

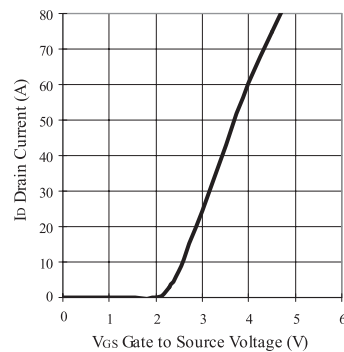
Notes

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

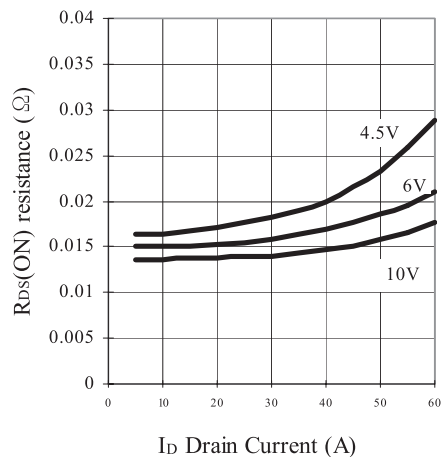
Typical Electrical Characteristics (N-Channel)



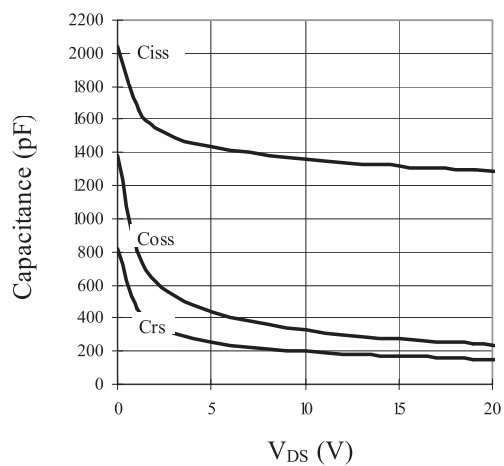
Output Characteristics



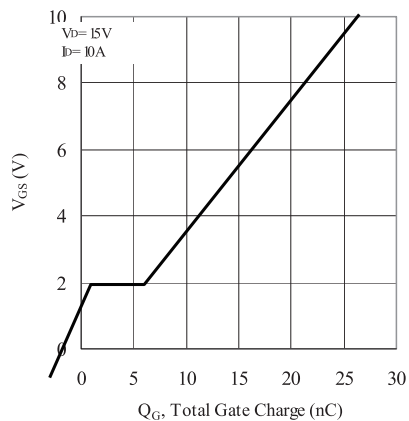
Transfer Characteristics



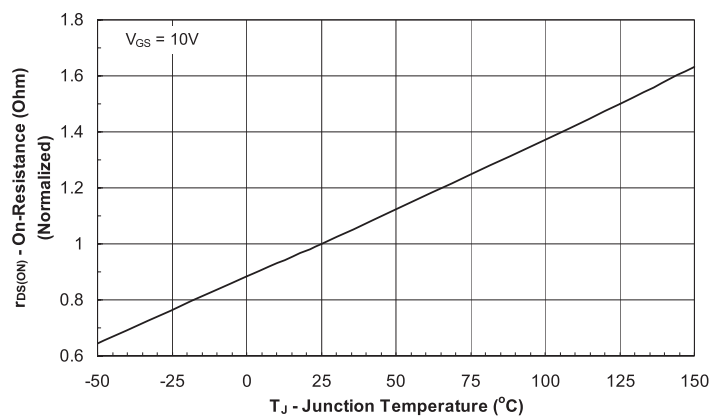
On Resistance vs. Drain Current



Capacitance

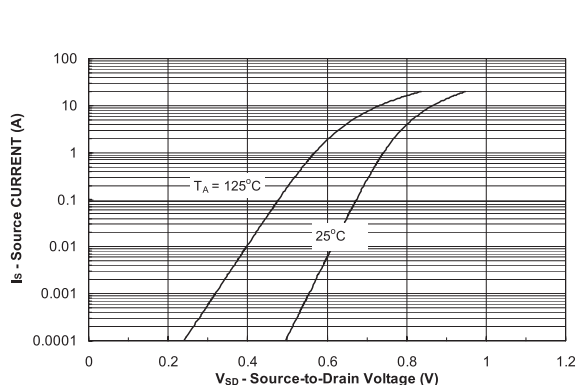


Gate Charge

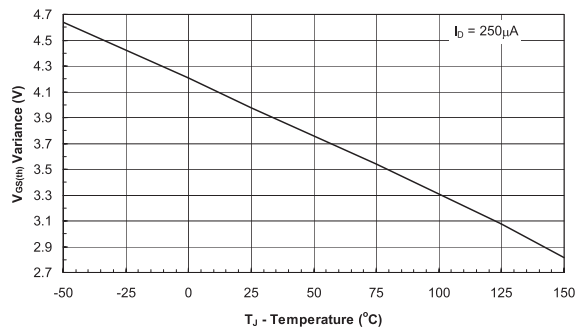


On-Resistance vs. Junction Temperature

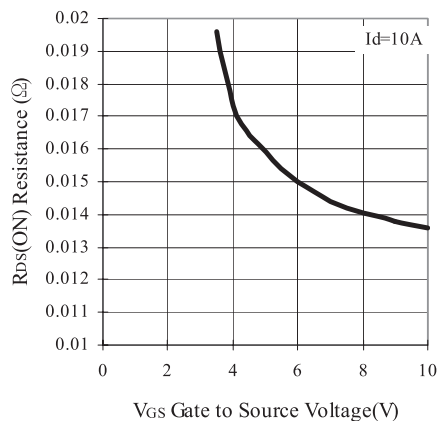
Typical Electrical Characteristics (N-Channel)



Source-Drain Diode Forward Voltage



Threshold Voltage



On-Resistance vs. Gate-to-Source Voltage

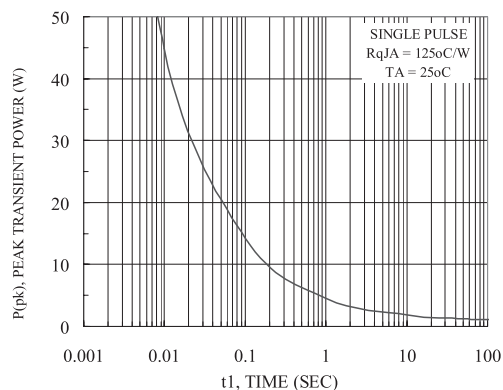


Figure 10. Single Pulse Maximum Power Dissipation

Normalized Thermal Transient Junction to Ambient

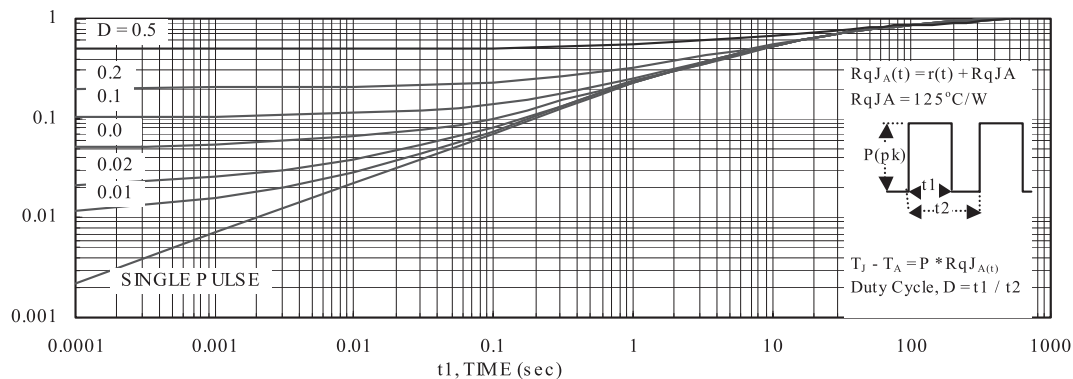
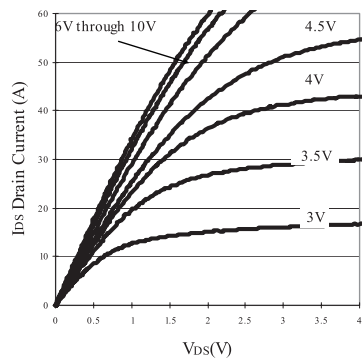
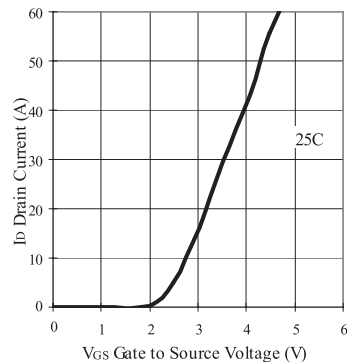


Figure 11. Transient Thermal Response Curve

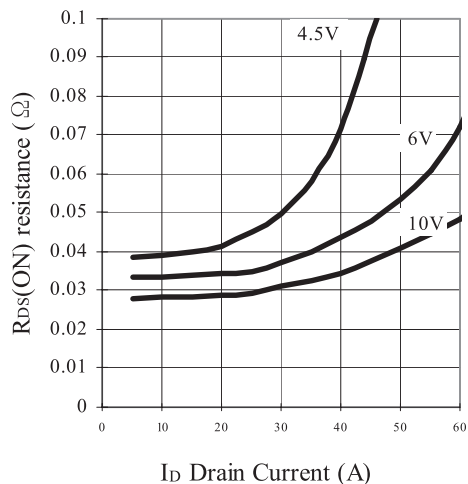
Typical Electrical Characteristics (P-Channel)



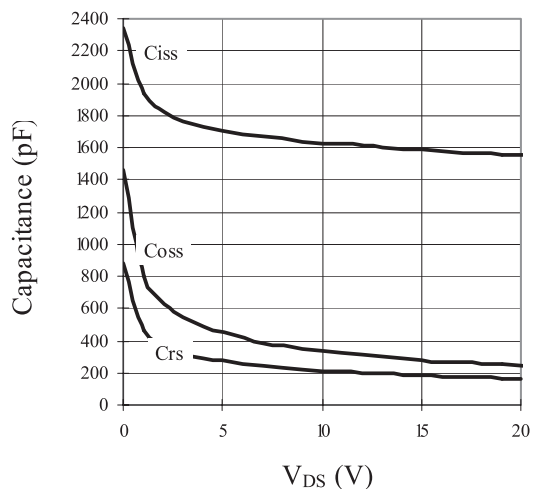
Output Characteristics



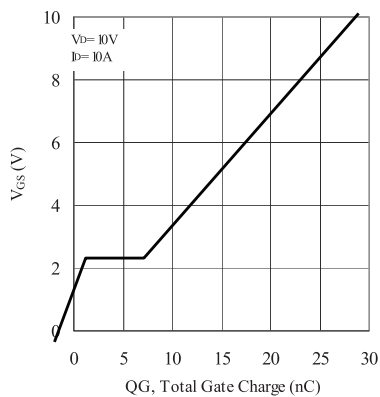
Transfer Characteristics



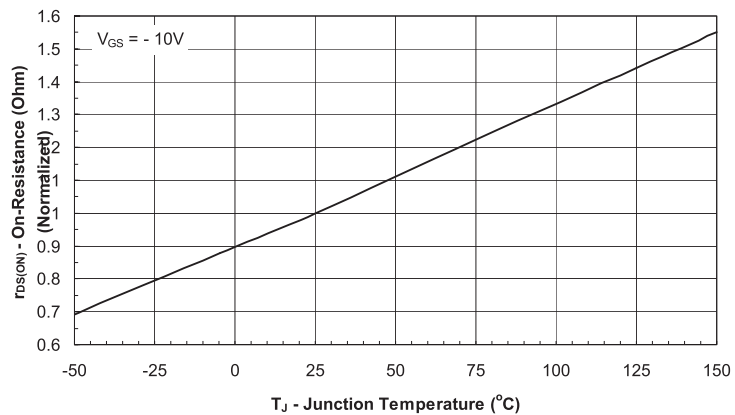
On Resistance Vs V_{GS} Voltage



Capacitance

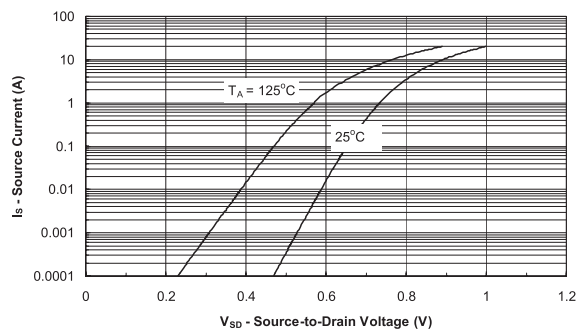


Gate Charge

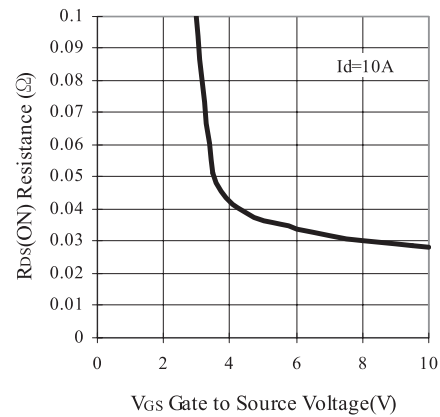


On-Resistance vs. Junction Temperature

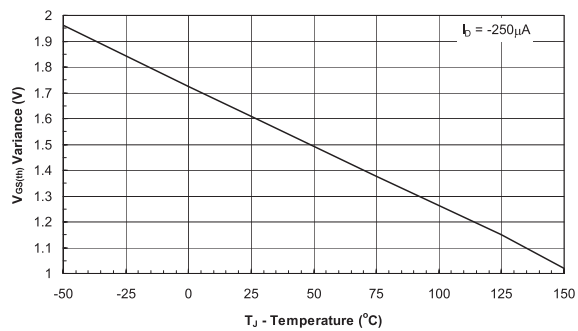
Typical Electrical Characteristics (P-Channel)



Source-Drain Diode Forward Voltage



On-Resistance with Gate to Source Voltage



Threshold Voltage

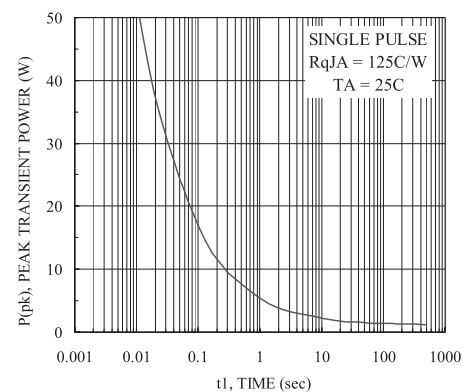


Figure 10. Single Pulse Maximum Power Dissipation

Normalized Thermal Transient Junction to Ambient

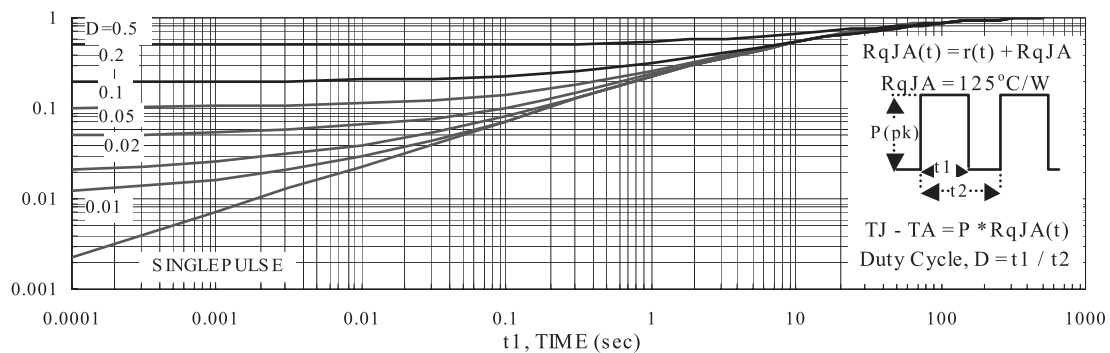
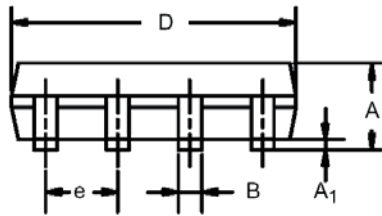
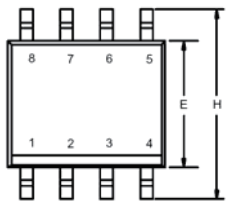


Figure 11. Transient Thermal Response Curve

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°

