GSM4559

60V N & P Pair Enhancement Mode MOSFET

Product Description

GSM4559, N & P Pair enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

These devices are particularly suited for low voltage power management, and low in-line power loss are needed in commercial industrial surface mount applications.

Features

N-Channel

- 60V/6.8A,$R_{DS(ON)}$=42mΩ@V_{GS}=10V
- 60V/5.6A,$R_{DS(ON)}$=50mΩ@V_{GS}=4.5V

P-Channel

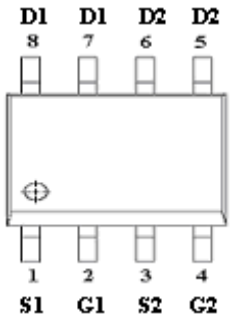
- -60V/-4.0A,$R_{DS(ON)}$=100mΩ@V_{GS}=-10V
- -60V/-3.0A,$R_{DS(ON)}$=120mΩ@V_{GS}=-4.5V

Applications

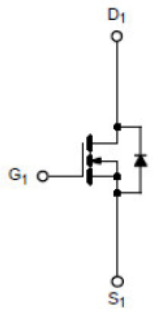
- Low Current DC/DC Conversion
- Load Switch
- CCFL Inverter
- Power Management in Notebook Computer

Packages & Pin Assignments

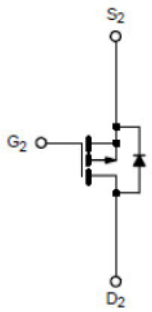
GSM4559SF(SOP-8P)



Pin	Description	Pin	Description
1	N-Source1	5	P-Drain2
2	N-Gate1	6	P-Drain2
3	P-Source2	7	N-Drain1
4	P-Gate2	8	N-Drain1

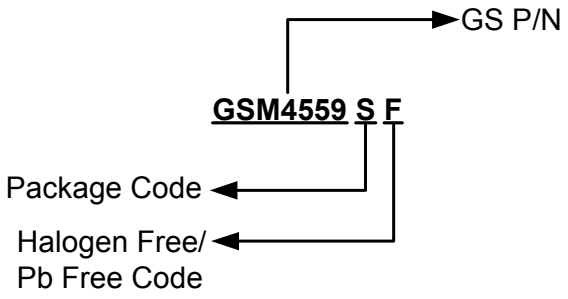


N-Channel MOSFET



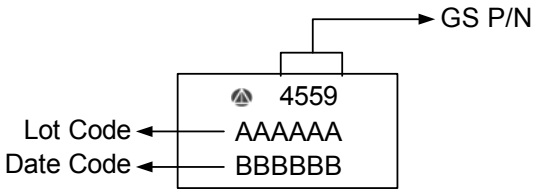
P-Channel MOSFET

Ordering Information



Part Number	Package	Quantity Reel
GSM4559SF	SOP-8P	3000 PCS

Marking Information



Absolute Maximum Ratings (N-Channel)

(T_A=25ºC unless otherwise noted)

Symbol	Parameter		Typical	Unit
V_{DSS}	Drain-Source Voltage		60	V
V_{GSS}	Gate –Source Voltage		±20	V
I_D	Continuous Drain Current(T_J=150ºC)	T_A=25ºC	6.8	A
		T_A=70ºC	5.6	
I_{DM}	Pulsed Drain Current		20	A
I_S	Continuous Source Current(Diode Conduction)		1.5	A
P_D	Power Dissipation	T_A=25ºC	2.8	W
		T_A=70ºC	1.8	
T_J	Operating Junction Temperature		150	ºC
T_{STG}	Storage Temperature Range		-55/150	ºC
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		62.5	ºC/ W

Electrical Characteristics (N-Channel)

(T_A=25ºC unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250uA	60			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	1.0		2.5	
I_{GSS}	Gate Leakage Current	V_{DS}=0V,V_{GS}=±20V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V,V_{GS}=0V			1	uA
		V_{DS}=60V,V_{GS}=0V, T_J=85ºC			5	
$I_{D(on)}$	On-State Drain Current	V_{DS}≧5V,V_{GS}=4.5V	30			A
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=10V,I_D=6.8A		35	42	mΩ
		V_{GS}=4.5V,I_D=5.6A		39	50	
g_{FS}	Forward Transconductance	V_{DS}=15V,I_D=5.3A		24		S
V_{SD}	Diode Forward Voltage	I_S=2.0A,V_{GS}=0V		0.8	1.2	V
Dynamic						
C_{iss}	Input Capacitance	V_{DS}=30V, V_{GS}=0V,f=1MHz		890		pF
C_{oss}	Output Capacitance			85		
C_{rss}	Reverse Transfer Capacitance			48		
Q_g	Total Gate Charge	V_{DS}=30V, V_{GS}=5V,I_D=5.6A		10	15	nC
Q_{gs}	Gate-Source Charge			3.5		
Q_{gd}	Gate-Drain Charge			3.6		
$t_{d(on)}$	Turn-On Time	V_{DD}=30V, R_L=6.8Ω ,I_D=5.0A, V_{GEN}=4.5V,R_G=6Ω		10	15	ns
T_r				12	20	
$t_{d(off)}$	Turn-Off Time			25	35	
T_f				10	15	

Absolute Maximum Ratings (P-Channel)

(T_A=25ºC unless otherwise noted)

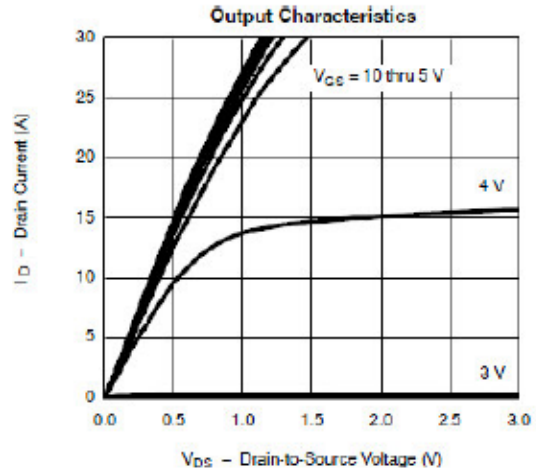
Symbol	Parameter		Typical	Unit
V_{DSS}	Drain-Source Voltage		-60	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current(T_J=150ºC)	T_A=25ºC	-4.0	A
		T_A=70ºC	-3.0	
I_{DM}	Pulsed Drain Current		-30	A
I_S	Continuous Source Current(Diode Conduction)		-1.7	A
P_D	Power Dissipation	T_A=25ºC	2.8	W
		T_A=70ºC	1.8	
T_J	Operating Junction Temperature		150	ºC
T_{STG}	Storage Temperature Range		-55/150	ºC
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		62.5	ºC/ W

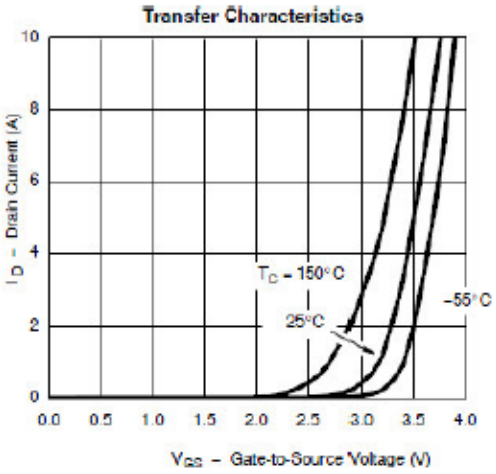
Electrical Characteristics (P-Channel)

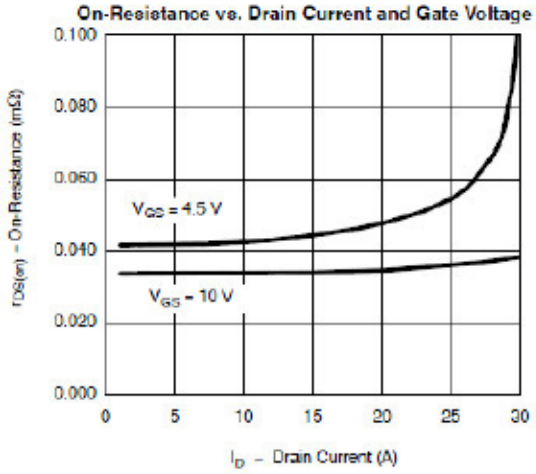
(T_A=25°C unless otherwise noted)

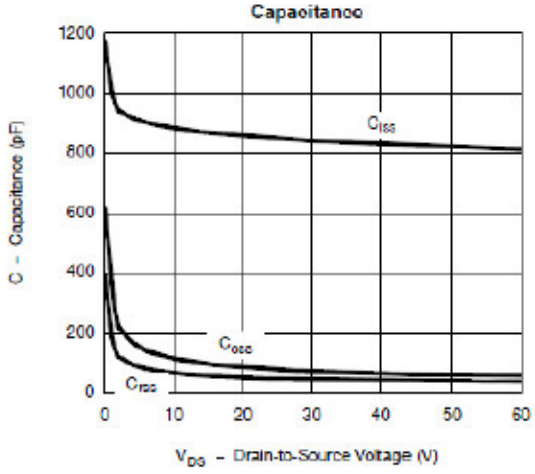
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=-250uA	-60			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250uA	-0.8		-2.5	
I_{GSS}	Gate Leakage Current	V_{DS}=0V,V_{GS}=±20V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-48V,V_{GS}=0V			-1	uA
		V_{DS}=-48V,V_{GS}=0V, T_J=85°C			-20	
$I_{D(on)}$	On-State Drain Current	V_{DS}≦-5V,V_{GS}=-10V	-20			A
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=-10V,I_D=-4.0A		92	100	mΩ
		V_{GS}=-4.5V,I_D=-3.0A		102	120	
g_{FS}	Forward Transconductance	V_{DS}=-15V,I_D=-3.2A		12		S
V_{SD}	Diode Forward Voltage	I_S=-2A,V_{GS}=0V		-0.8	-1.2	V
Dynamic						
C_{iss}	Input Capacitance	V_{DS}=-30V, V_{GS}=0V,f=1MHz		900		pF
C_{oss}	Output Capacitance			90		
C_{rss}	Reverse Transfer Capacitance			40		
Q_g	Total Gate Charge	V_{DS}=-30V, V_{GS}=-10V,I_D=-4.0A		12	20	nC
Q_{gs}	Gate-Source Charge			2.5		
Q_{gd}	Gate-Drain Charge			3.5		
$t_{d(on)}$	Turn-On Time	V_{DD}=-30V, R_L=7.5Ω ,I_D=-3.0A, V_{GEN}=-10V,R_G=3Ω		10	20	ns
T_r				6	10	
$t_{d(off)}$	Turn-Off Time			30	45	
T_f				12	25	

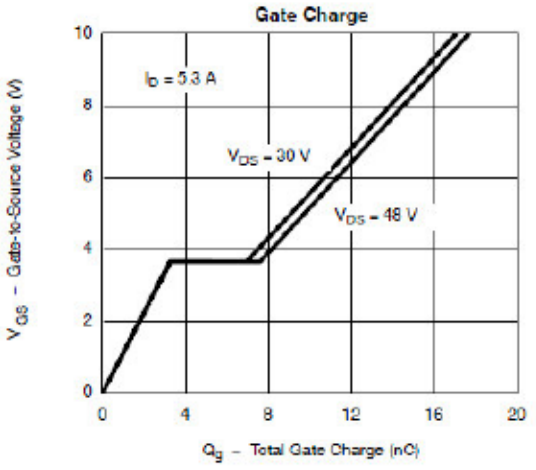
Typical Performance Characteristics (N-Channel)

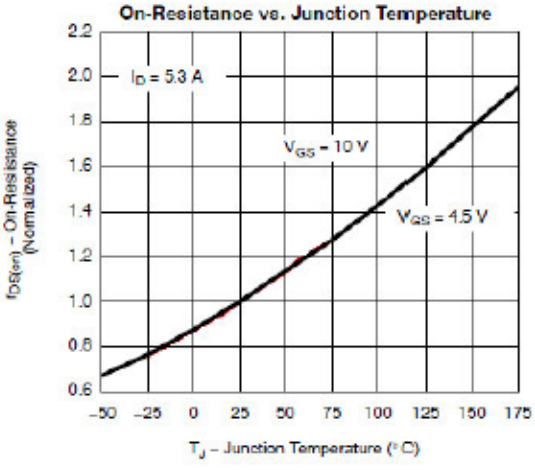




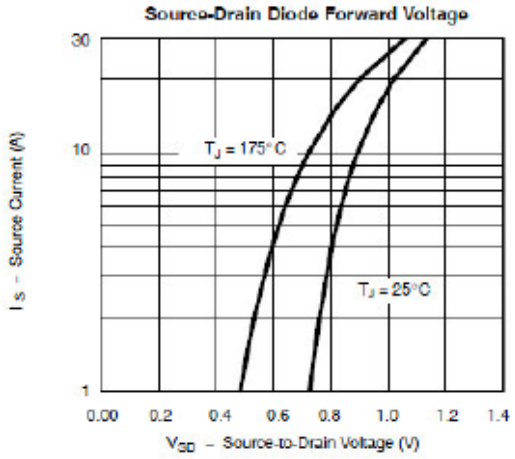


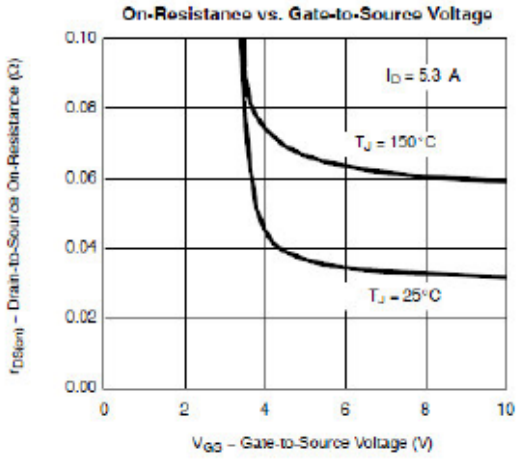


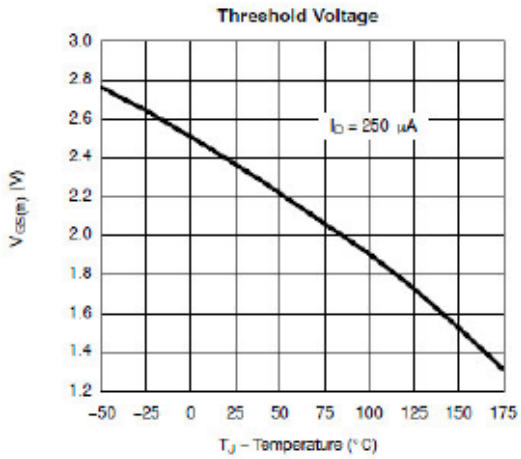


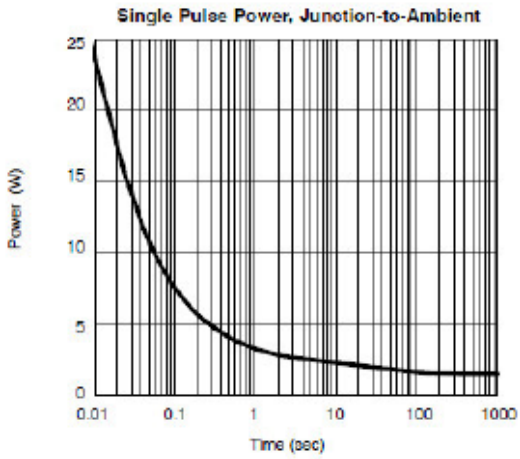


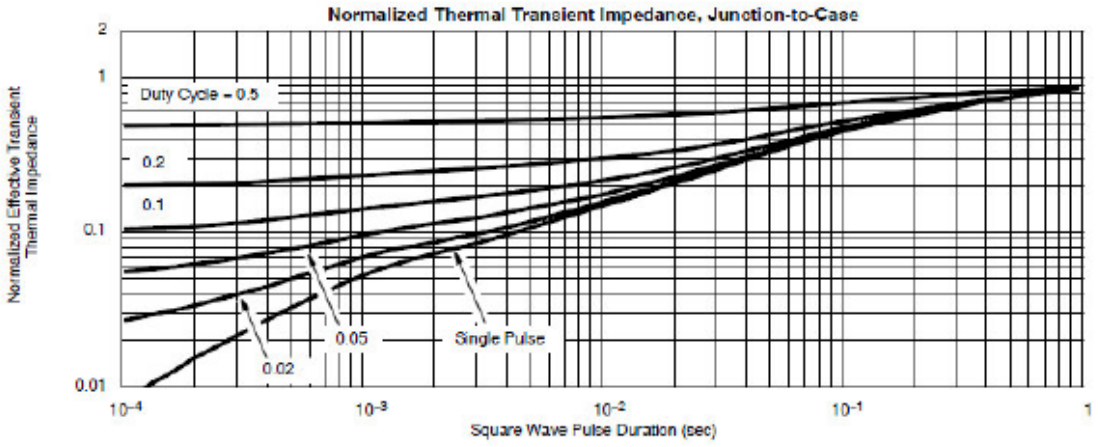
Typical Performance Characteristics (N-Channel)



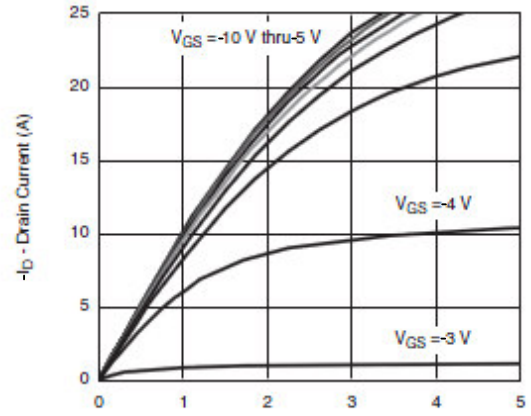




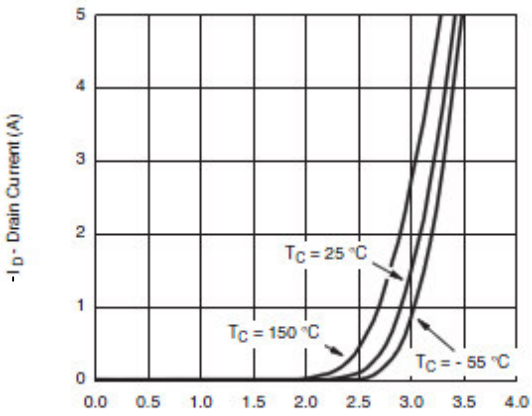




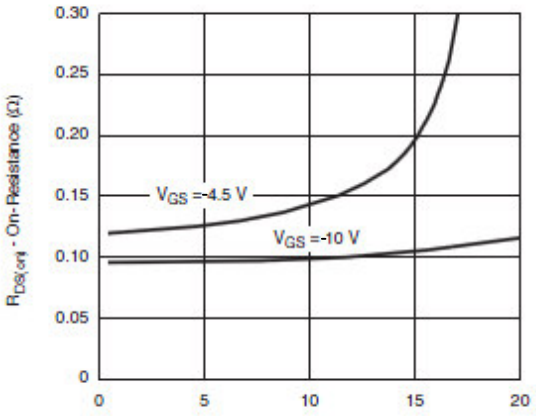
Typical Performance Characteristics (P-Channel)



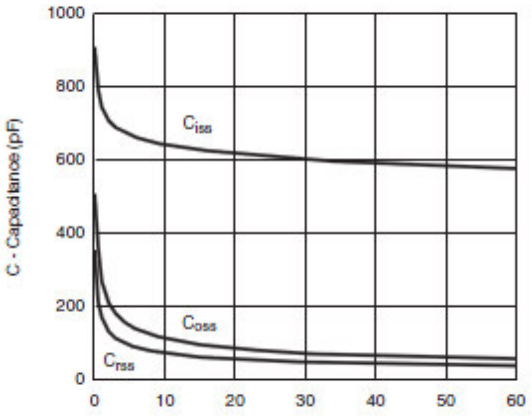
Output Characteristics



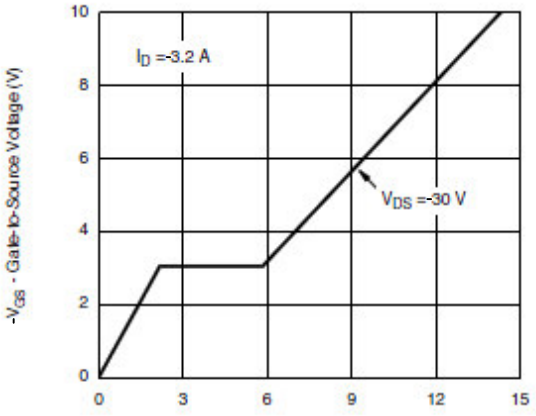
Transfer Characteristics



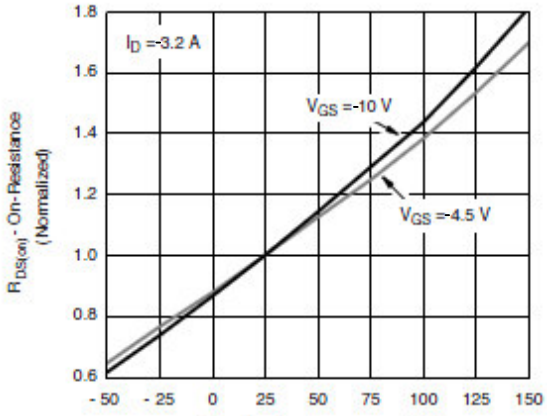
On-Resistance vs. Drain Current



Capacitance

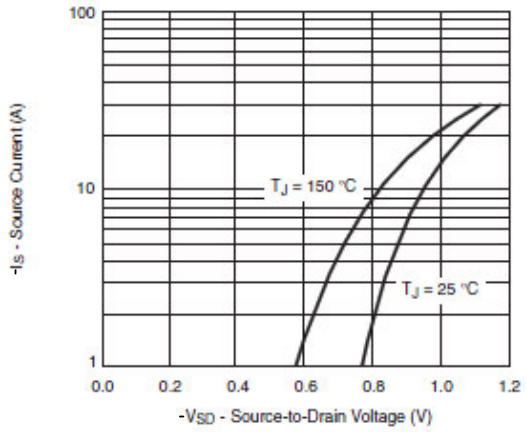


Gate Charge

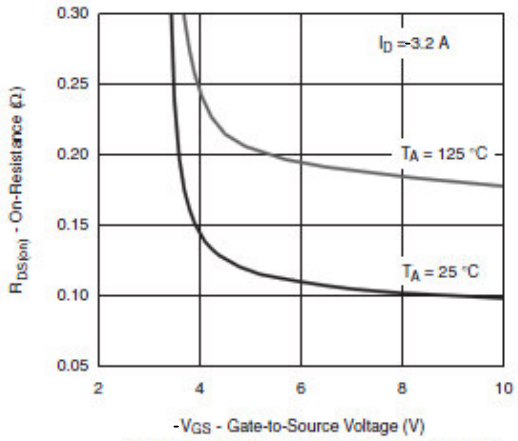


On-Resistance vs. Junction Temperature

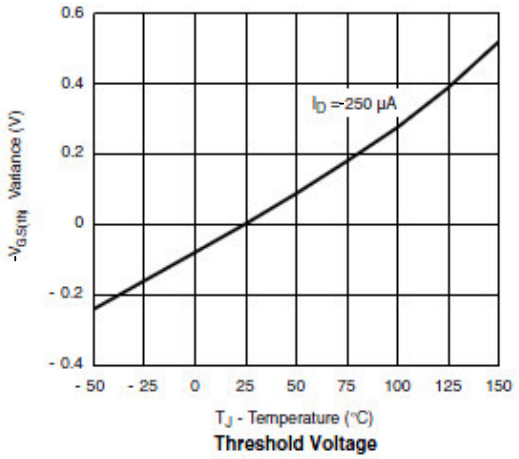
Typical Performance Characteristics (P-Channel)



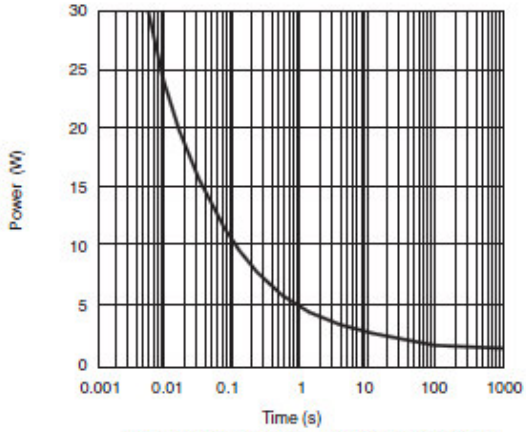
Source-Drain Diode Forward Voltage



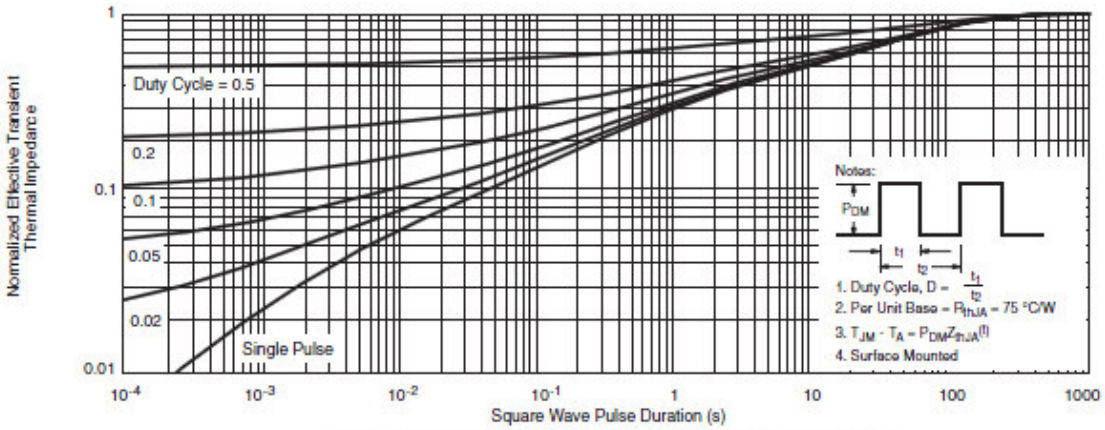
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



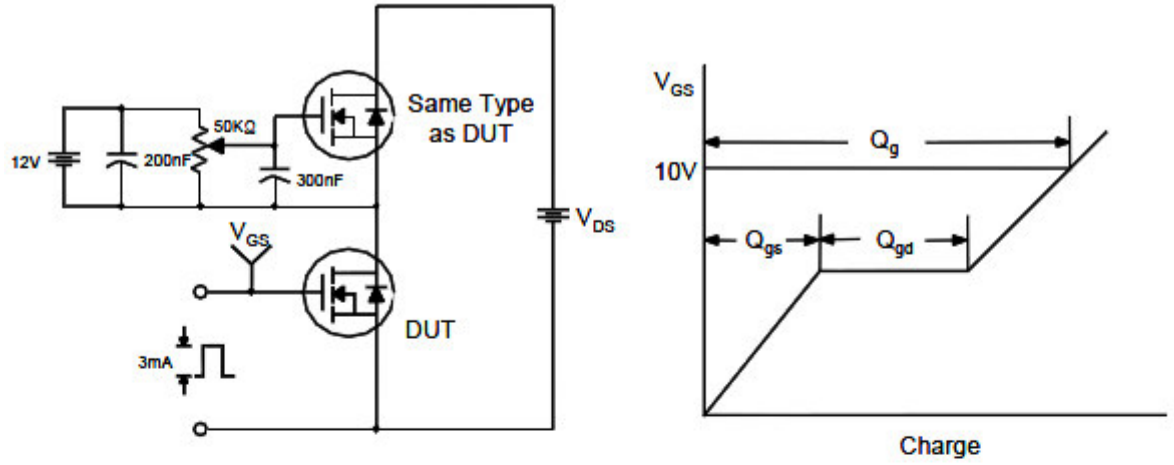
Single Pulse Power, Junction-to-Ambient



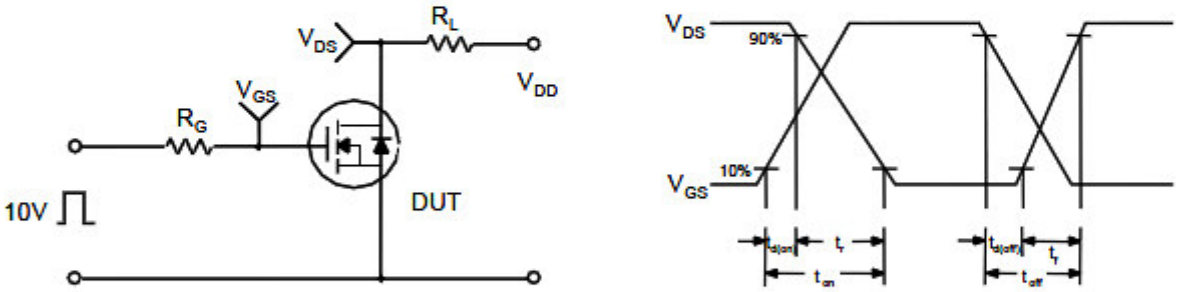
Normalized Thermal Transient Impedance, Junction-to-Ambient

Typical Performance Characteristics

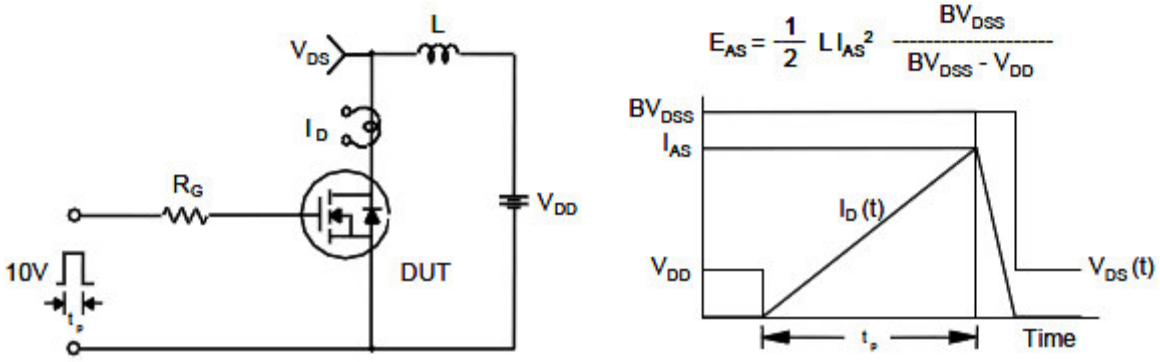
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

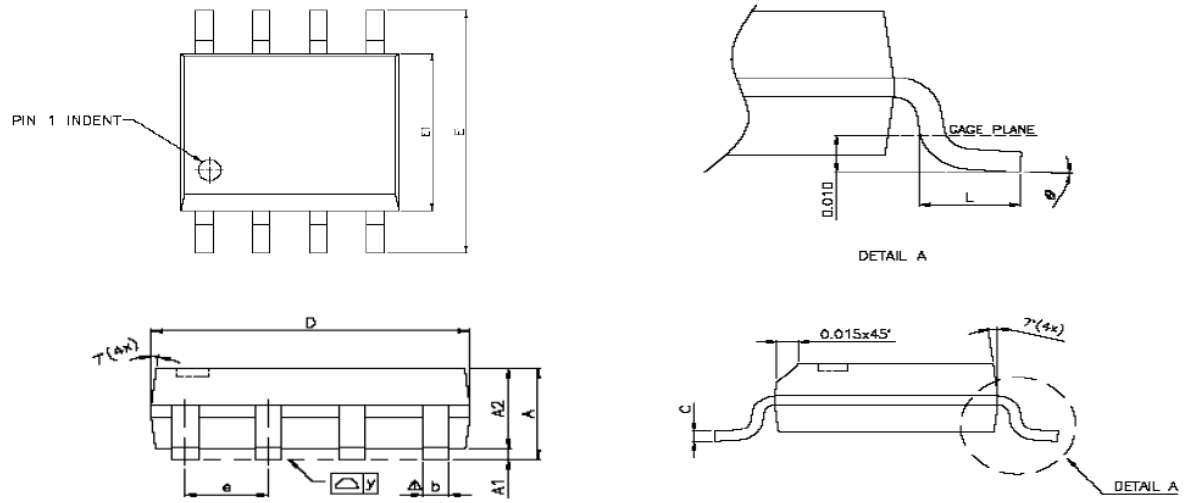


Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension

SOP-8P PLASTIC PACKAGE



Dimensions						
SYMBOL	Millimeters			Inches		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.47	1.60	1.73	0.058	0.063	0.068
A1	0.10	-	0.25	0.004	-	0.010
A2	-	1.45	-	-	0.057	-
b	0.33	0.41	0.51	0.013	0.016	0.020
C	0.19	0.20	0.25	0.0075	0.008	0.0098
D	4.80	4.85	4.95	0.189	0.191	0.195
E	5.80	6.00	6.20	0.228	0.236	0.244
E1	3.80	3.90	4.00	0.150	0.154	0.157
e	-	1.27	-	-	0.050	-
L	0.38	0.71	1.27	0.015	0.028	0.050
⚠2 y	-	-	0.076	-	-	0.003
θ	0°	-	8°	0°	-	8°

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