

GSM5606

60V N & P Pair Enhancement Mode MOSFET

Product Description

GSM5606, 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/15A, $R_{DS(ON)}=42m\Omega@V_{GS}=10V$
- 60V/12A, $R_{DS(ON)}=50m\Omega@V_{GS}=4.5V$

P-Channel

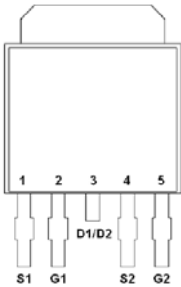
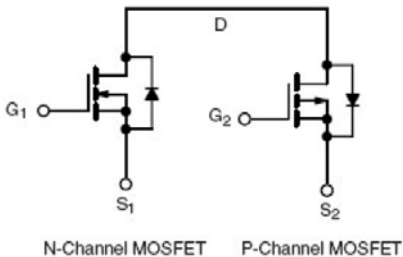
- -60V/-15A, $R_{DS(ON)}=100m\Omega@V_{GS}=-10V$
- -60V/-12A, $R_{DS(ON)}=120m\Omega@V_{GS}=-4.5V$

Applications

- DC/DC Conversion
- Load Switch
- DC FAN

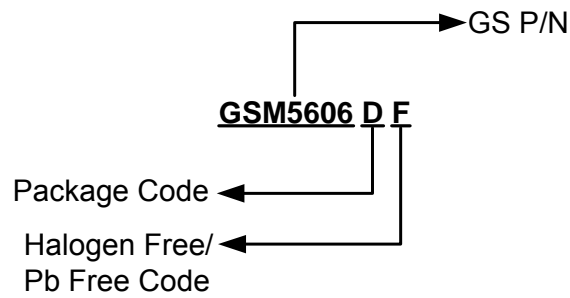
Packages & Pin Assignments

GSM5606DF(TO-252-4L)

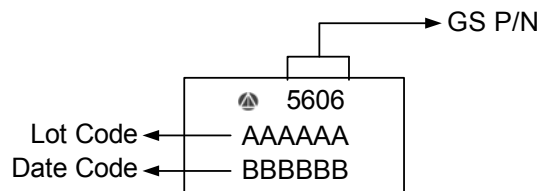
Pin	Description	Pin	Description
1	Source1	4	Source2
2	Gate1	5	Gate2
3	Drain 1/2		

Ordering Information



Part Number	Package	Quantity Reel
GSM5606DF	TO-252-4L	2500 PCS

Marking Information



Absolute Maximum Ratings (N-Channel)

($T_A=25^\circ\text{C}$ 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($T_J=150^\circ\text{C}$)	$T_A=25^\circ\text{C}$	7.0
		$T_A=70^\circ\text{C}$	6.0
I_{DM}	Pulsed Drain Current	20	A
I_S	Continuous Source Current(Diode Conduction)	1.5	A
P_D	Power Dissipation	$T_A=25^\circ\text{C}$	2.8
		$T_A=70^\circ\text{C}$	1.8
T_J	Operating Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55/150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	62.5	$^\circ\text{C}/\text{W}$

Electrical Characteristics (N-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	1.0		2.5	V
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 =85°C			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 =15A		38	42	mΩ
		V _{GS} =4.5V, I _D =12A		42	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=25°C unless otherwise noted)

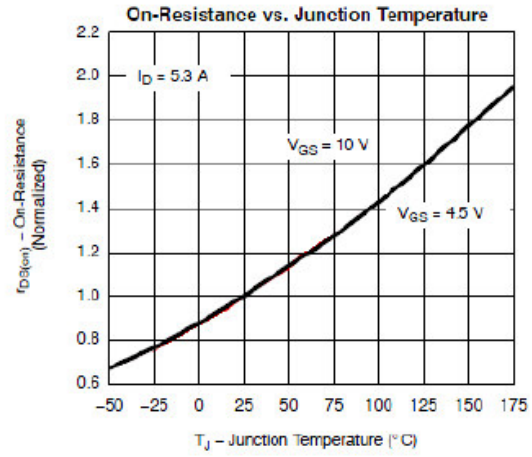
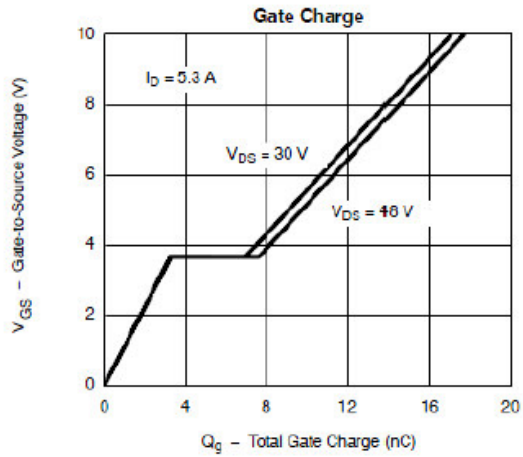
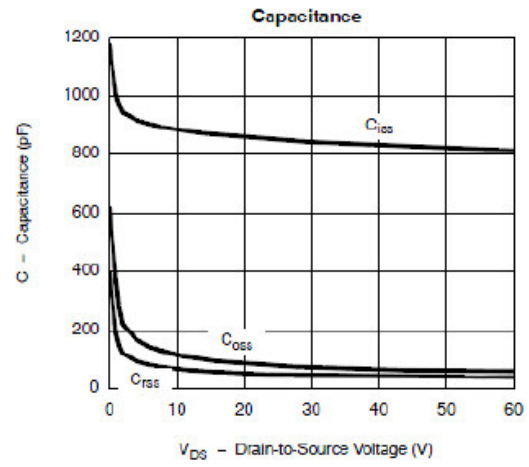
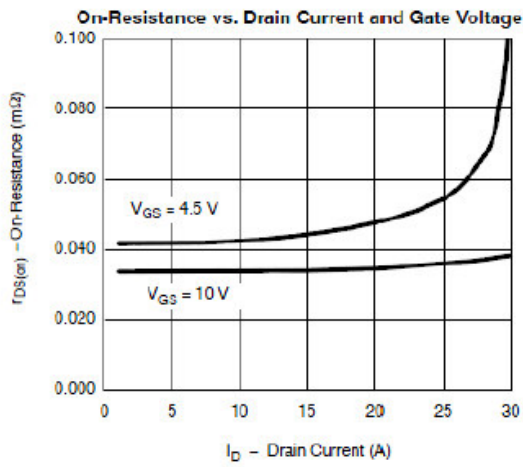
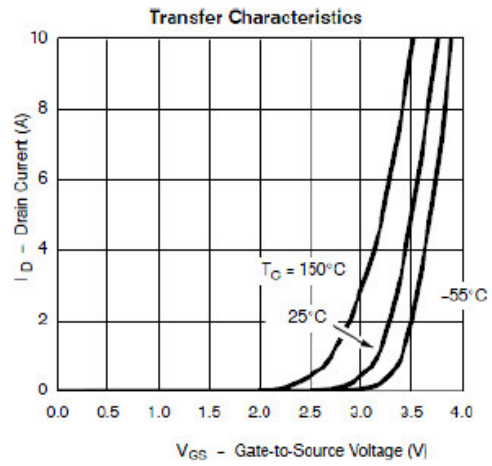
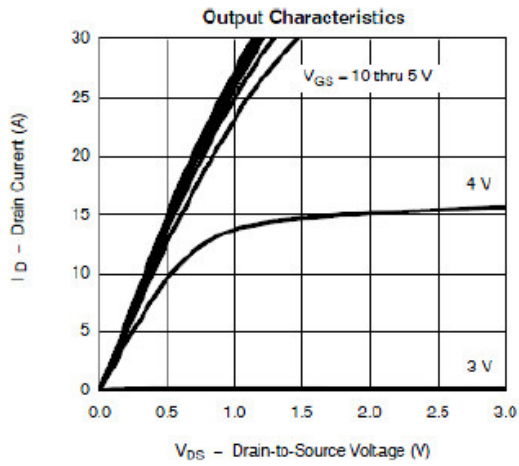
Symbol	Parameter	Typical	Unit
V _{DSS}	Drain-Source Voltage	-60	V
V _{GSS}	Gate-Source Voltage	±20	V
I _D	Continuous Drain Current (T _J =150°C)	T _A =25°C	-5.0
		T _A =70°C	-4.0
I _{DM}	Pulsed Drain Current	-30	A
I _S	Continuous Source Current (Diode Conduction)	-1.7	A
P _D	Power Dissipation	T _A =25°C	2.8
		T _A =70°C	1.8
T _J	Operating Junction Temperature	150	°C
T _{STG}	Storage Temperature Range	-55/150	°C
R _{θJA}	Thermal Resistance-Junction to Ambient	62.5	°C/W

Electrical Characteristics (P-Channel)

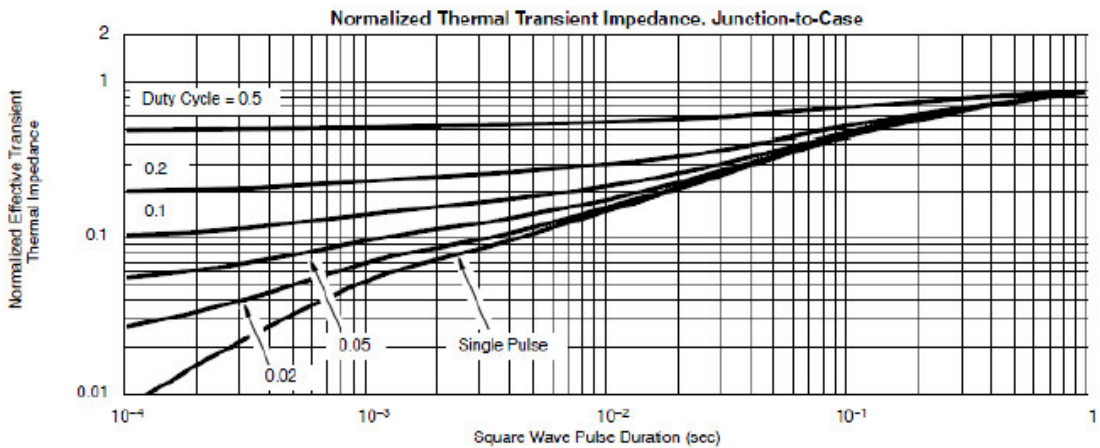
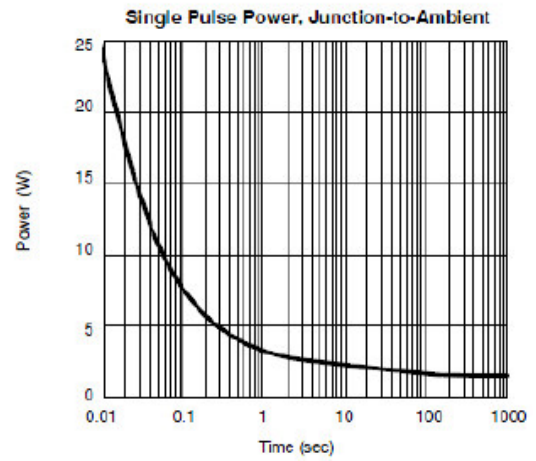
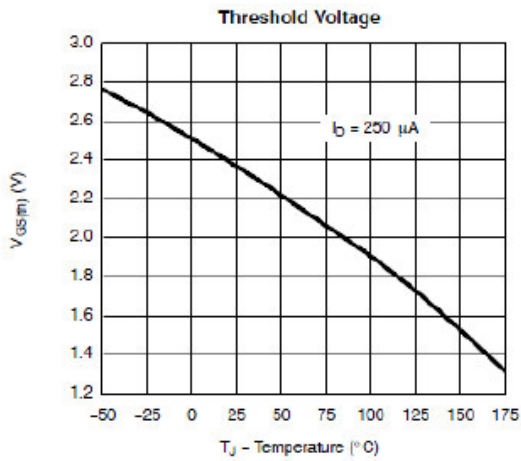
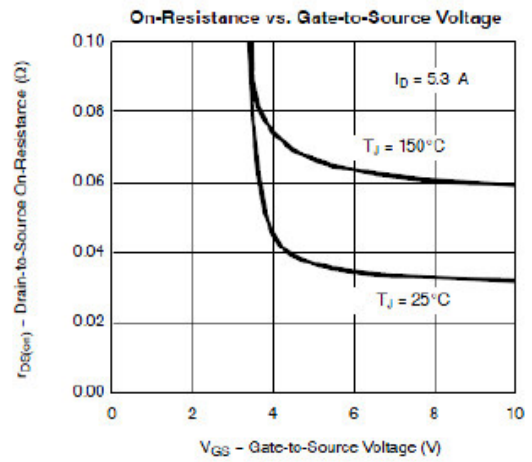
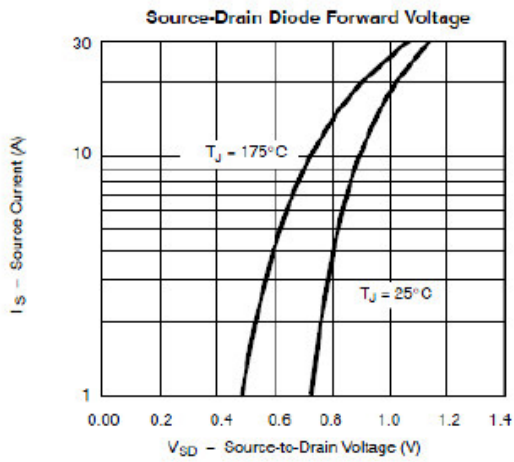
(T_A=25°C unless otherwise noted)

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 =-15A		88	100	mΩ	
		V _{GS} =-4.5V, I _D =-12A		98	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

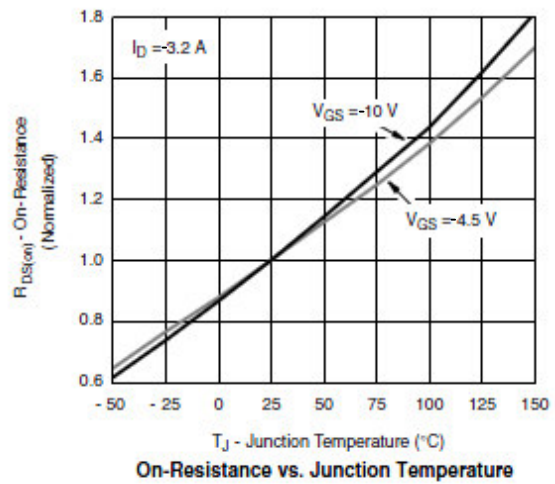
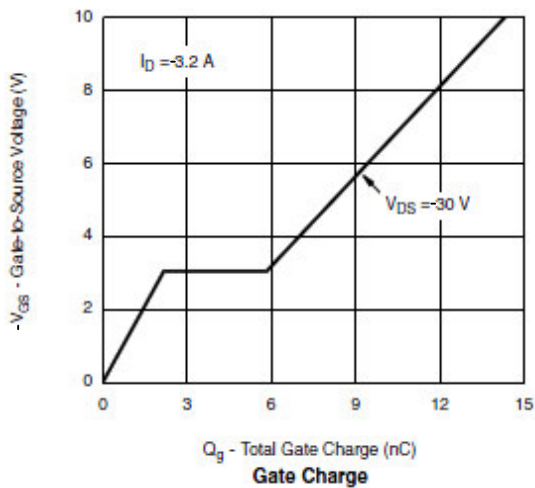
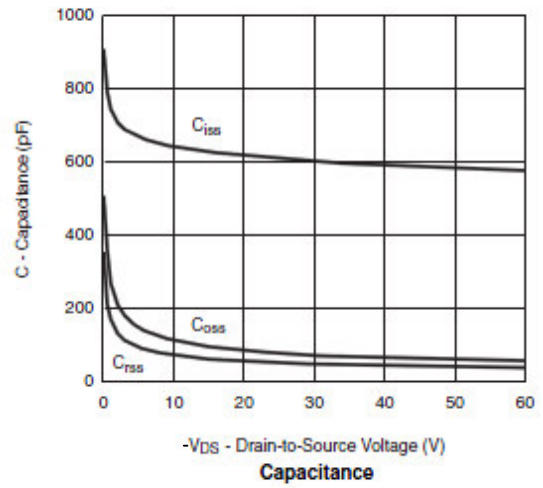
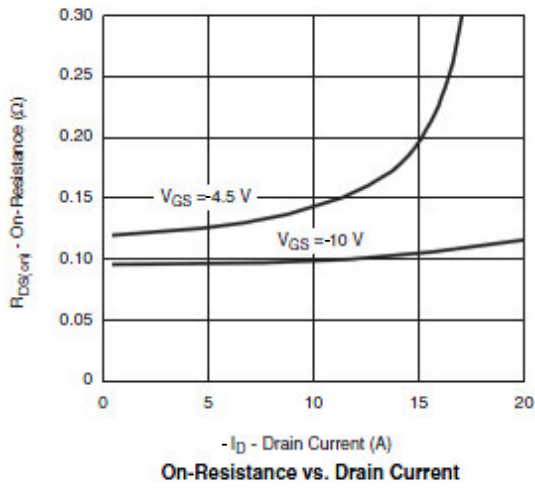
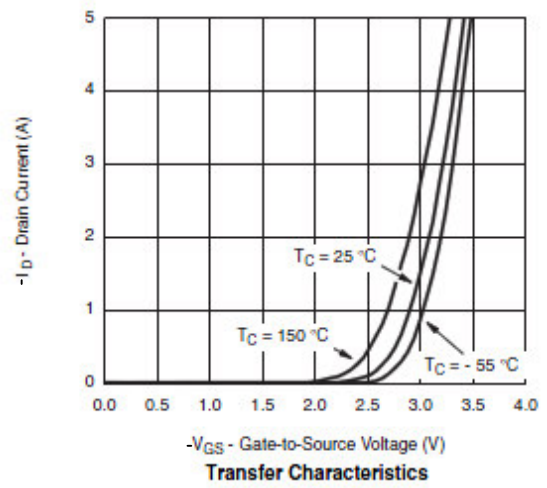
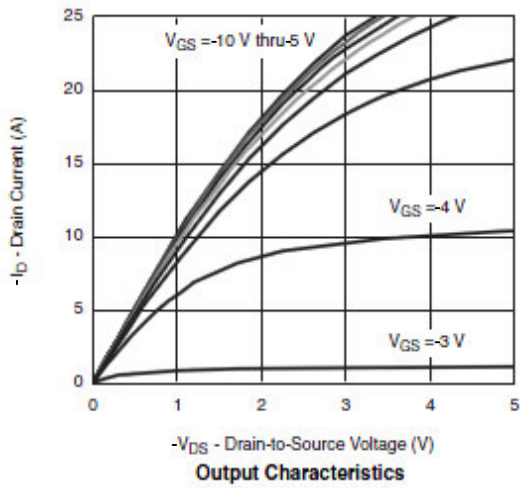
Typical Performance Characteristics (N-Channel)



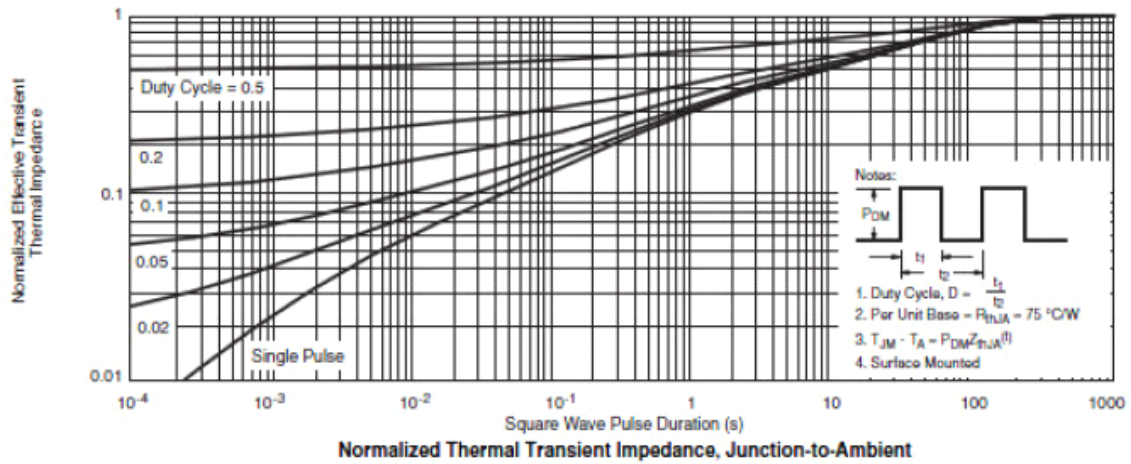
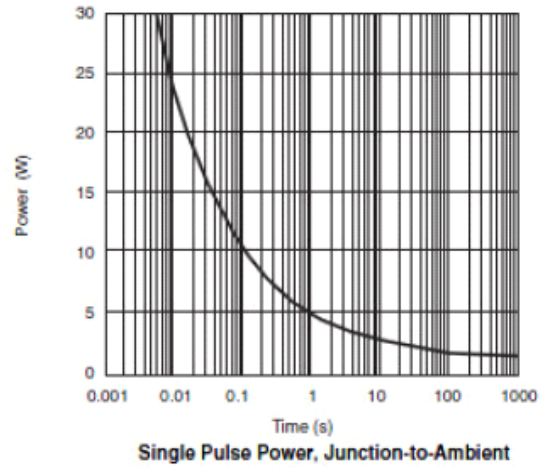
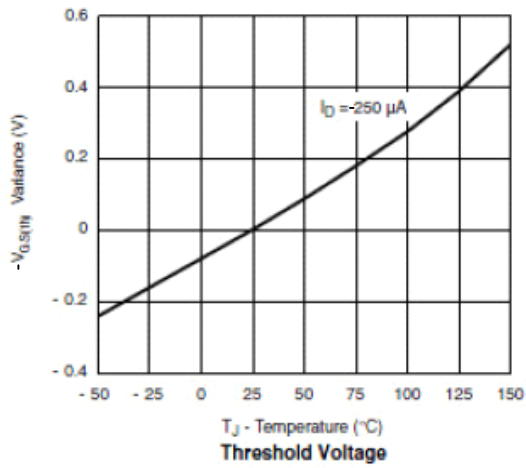
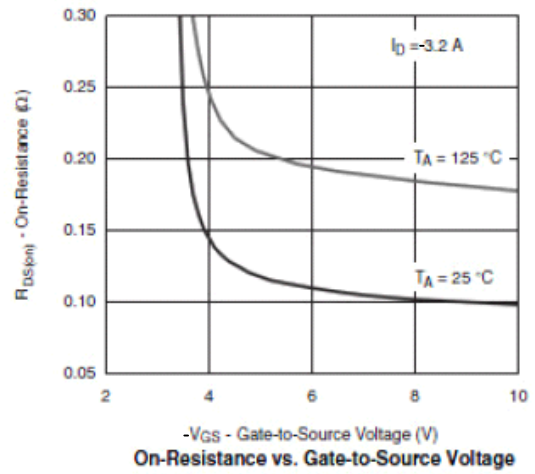
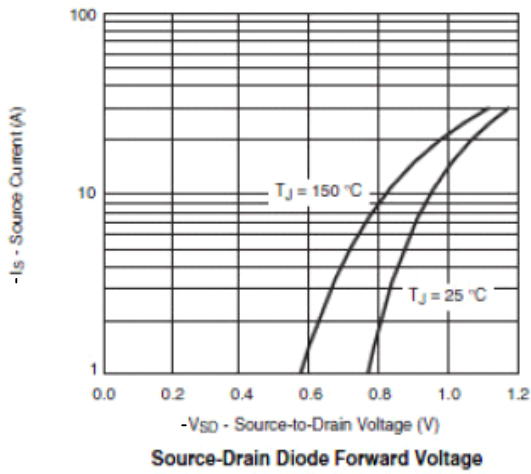
Typical Performance Characteristics (N-Channel)



Typical Performance Characteristics (P-Channel)

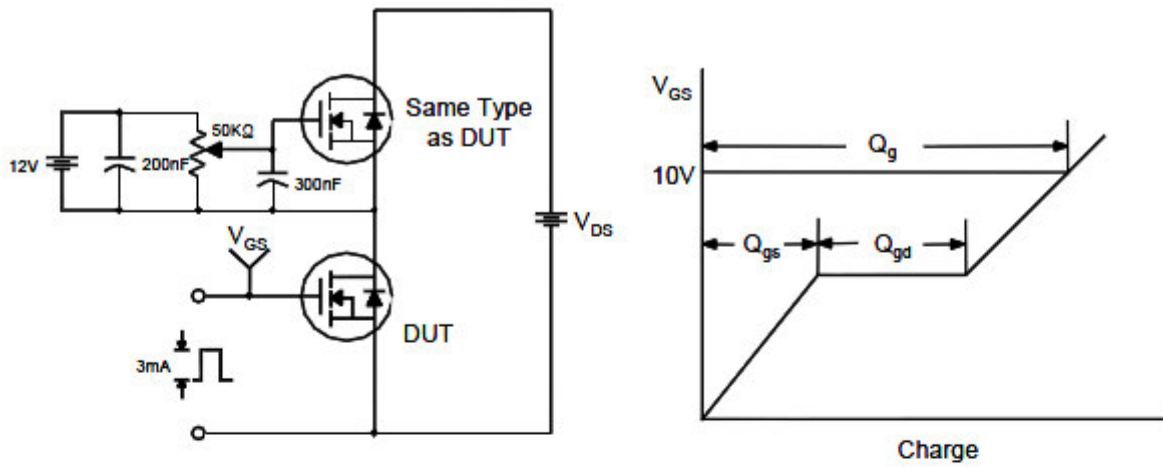


Typical Performance Characteristics (P-Channel)

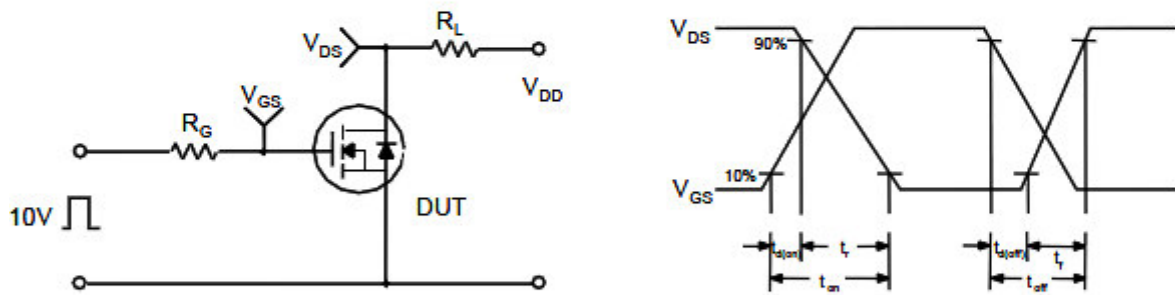


Typical Performance Characteristics

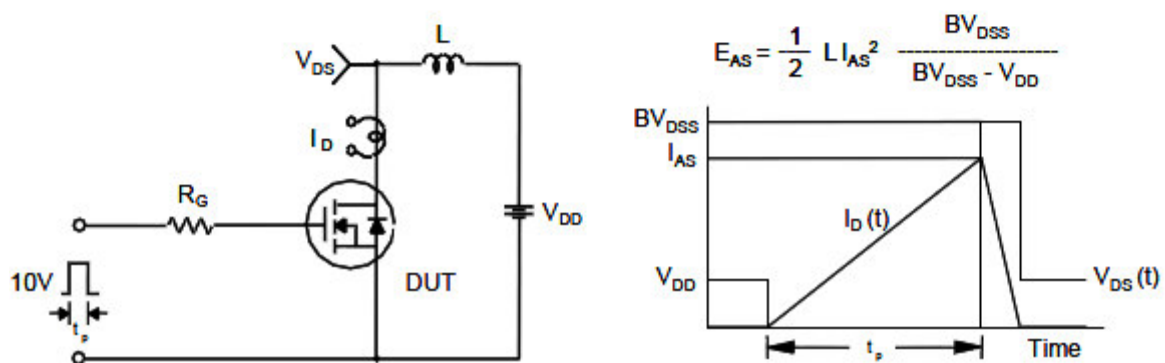
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

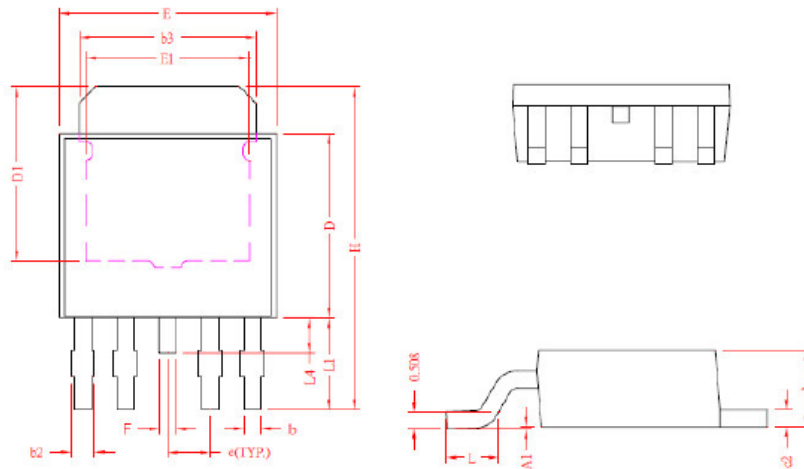


Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension

TO-252-4L PLASTIC PACKAGE











Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	2.20	2.40	0.086	0.094
A1	0	0.15	0	0.005
b	0.40	0.60	0.015	0.023
b2	0.50	0.80	0.019	0.031
b3	5.20	5.50	0.204	0.216
c2	0.45	0.55	0.017	0.021
D	5.40	5.80	0.212	0.228
D1	4.57	-	0.179	-
E	6.40	6.80	0.251	0.267
E1	3.81	-	0.150	-
e	1.27 (REF)		0.05 (REF)	
F	0.40	0.60	0.015	0.023
H	9.40	10.20	0.370	0.401
L	1.40	1.77	0.055	0.069
L1	2.40	3.00	0.094	0.118
L4	0.80	1.20	0.031	0.047



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