



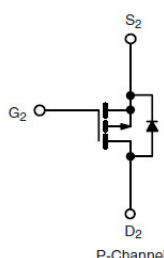
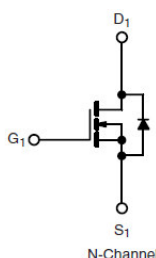
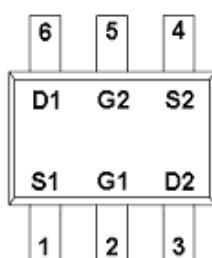
### General Description

AFC6332, 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, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

### Features

- N-Channel  
20V/1.0A,  $R_{DS(ON)}=280m\Omega@V_{GS}=4.5V$   
20V/0.8A,  $R_{DS(ON)}=340m\Omega@V_{GS}=2.5V$   
20V/0.7A,  $R_{DS(ON)}=580m\Omega@V_{GS}=1.8V$
- P-Channel  
-20V/-0.6A,  $R_{DS(ON)}= 600 m\Omega@ V_{GS} =-4.5V$   
-20V/-0.5A,  $R_{DS(ON)}= 840 m\Omega@ V_{GS} =-2.5V$   
-20V/-0.4A,  $R_{DS(ON)}= 1440 m\Omega@ V_{GS} =-1.8V$
- Low-Voltage Operation
- High-Speed Circuits
- Low Battery Voltage Operation
- SOT-363 package design

### Pin Description ( SOT-363 )



### Application

- Load Switch for Portable Devices, Smart Phones, Pagers

### Pin Define

Pin	Symbol	Description
1	S1	Source 1
2	G1	Gate 1
3	D2	Drain 2
4	S2	Source 2
5	G2	Gate 2
6	D1	Drain1

### Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFC6332S36RG	32YW	SOT-363	Tape & Reel	3000 EA

- ※ 32 parts code
- ※ Y year code ( 0 ~ 9 )
- ※ W week code ( A ~ Z = 1 ~ 26 / a ~ z = 27 ~ 52 )
- ※ AFC6332S36RG : 7" Tape & Reel ; Pb- Free ; Halogen- Free



**Absolute Maximum Ratings**

(T<sub>A</sub>=25°C Unless otherwise noted)

Parameter	Symbol	Typical		Unit	
		N-Channel	P-Channel		
Drain-Source Voltage	V <sub>DSS</sub>	20	-20	V	
Gate –Source Voltage	V <sub>GSS</sub>	±12	±12	V	
Continuous Drain Current(T <sub>J</sub> =150°C)	I <sub>D</sub>	T <sub>A</sub> =25°C	1.0	-0.6	A
		T <sub>A</sub> =70°C	0.7	-0.4	
Pulsed Drain Current	I <sub>DM</sub>	6	-6	A	
Continuous Source Current(Diode Conduction)	I <sub>S</sub>	1	-1	A	
Power Dissipation	P <sub>D</sub>	T <sub>A</sub> =25°C	0.3		W
		T <sub>A</sub> =70°C	0.2		
Operating Junction Temperature	T <sub>J</sub>	-55/150		°C	
Storage Temperature Range	T <sub>STG</sub>	-55/150		°C	

**Electrical Characteristics ( N-Channel )**

(T<sub>A</sub>=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	20			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	0.4		1.0	
Gate Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V			1	uA
		V <sub>DS</sub> =20V, V <sub>GS</sub> =0V T <sub>J</sub> =85°C			5	
On-State Drain Current	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 5V, V <sub>GS</sub> =4.5V	1.2			A
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =1.0A		220	280	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.8A		260	340	
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =0.7A		340	580	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =1.0A		1		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1.0A, V <sub>GS</sub> =0V		0.65	1.2	V
<b>Dynamic</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V f=1MHz		70		pF
Output Capacitance	C <sub>oss</sub>			20		
Reverse Transfer Capacitance	C <sub>rss</sub>			8		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V I <sub>D</sub> ≧1.2A		1.06	1.38	nC
Gate-Source Charge	Q <sub>gs</sub>			0.18		
Gate-Drain Charge	Q <sub>gd</sub>			0.32		
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> =10V, R <sub>L</sub> =20Ω I <sub>D</sub> ≧1.2A, V <sub>GEN</sub> =4.5V R <sub>G</sub> =1Ω		18	26	ns
	t <sub>r</sub>			20	28	
Turn-Off Time	t <sub>d(off)</sub>			70	110	
	t <sub>f</sub>			25	40	



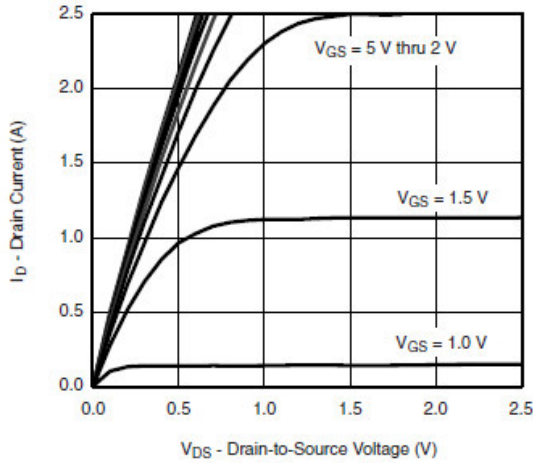
**Electrical Characteristics ( P-Channel )**

(T<sub>A</sub>=25°C Unless otherwise noted)

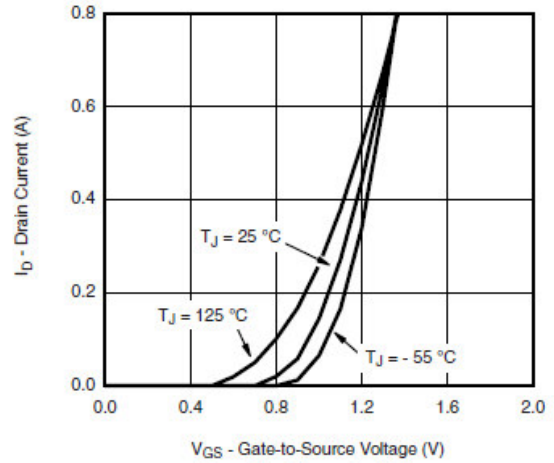
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-20			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-0.4		-1.0	
Gate Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V			-1	uA
		V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V T <sub>J</sub> =85°C			-5	
On-State Drain Current	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 5V, V <sub>GS</sub> =4.5V	0.7			A
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-0.6A		500	600	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-0.5A		700	840	
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-0.4A		1000	1440	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =-10V, I <sub>D</sub> =-0.4A		1		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-0.15A, V <sub>GS</sub> =0V		0.65	1.2	V
<b>Dynamic</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V f=1MHz		70	100	pF
Output Capacitance	C <sub>oss</sub>			20		
Reverse Transfer Capacitance	C <sub>rss</sub>			10		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =-4.5V I <sub>D</sub> ≡-0.25A		1.0	1.3	nC
Gate-Source Charge	Q <sub>gs</sub>			0.1		
Gate-Drain Charge	Q <sub>gd</sub>			0.3		
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> =-10V, R <sub>L</sub> =30Ω I <sub>D</sub> ≡-0.2A, V <sub>GEN</sub> =-4.5V R <sub>G</sub> =10Ω		10	15	ns
	t <sub>r</sub>			10	15	
Turn-Off Time	t <sub>d(off)</sub>			40	60	
	t <sub>f</sub>			30	50	



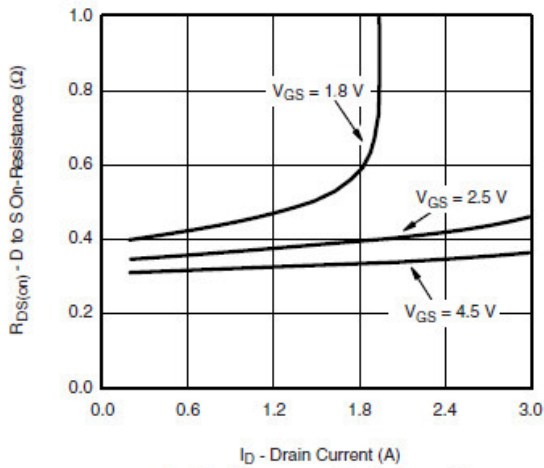
## Typical Characteristics ( N-Channel )



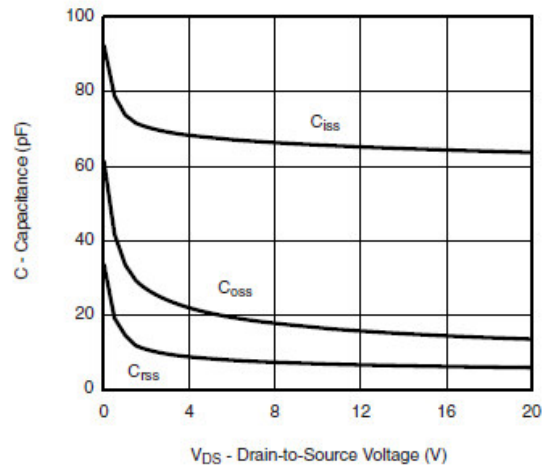
Output Characteristics



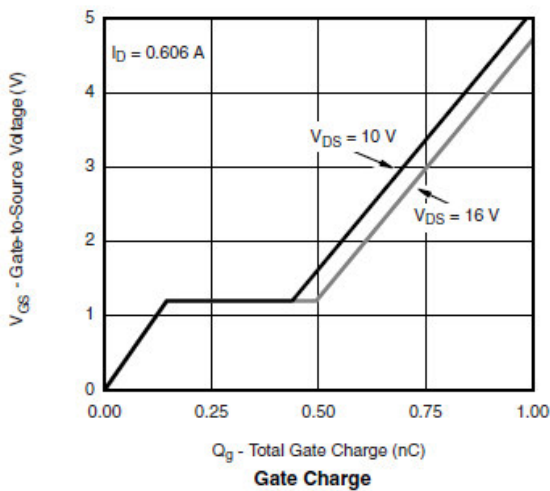
Transfer Characteristics



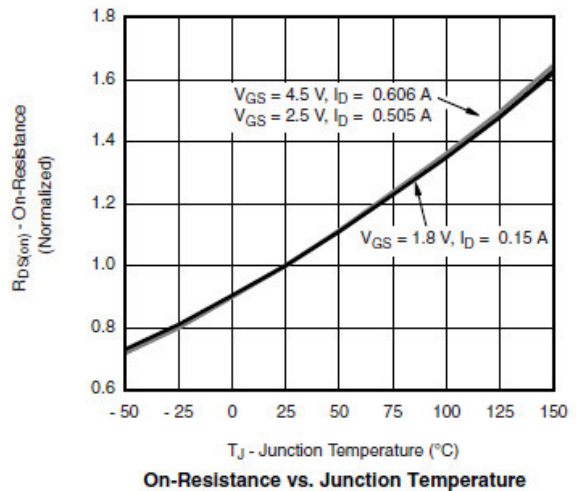
On-Resistance vs. Drain Current



Capacitance



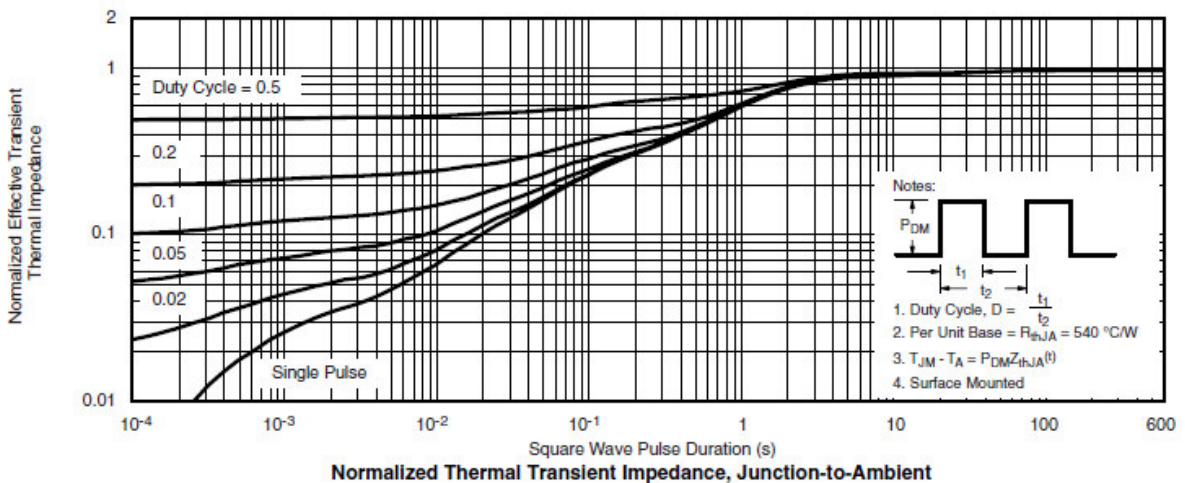
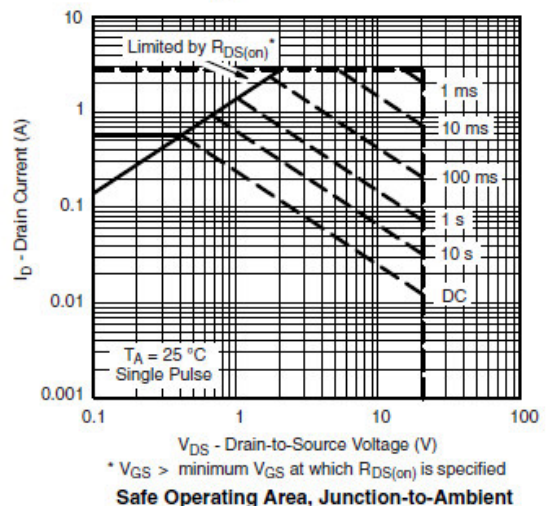
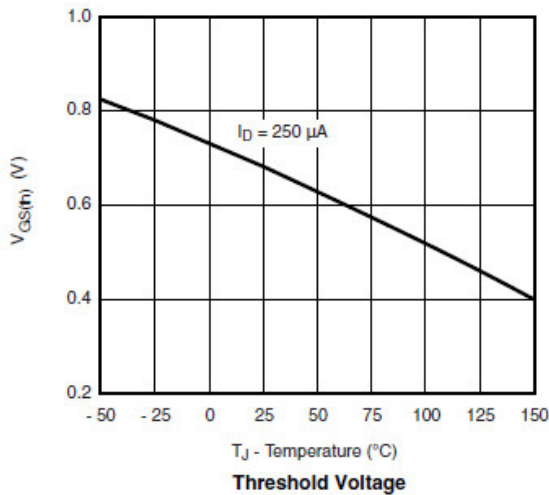
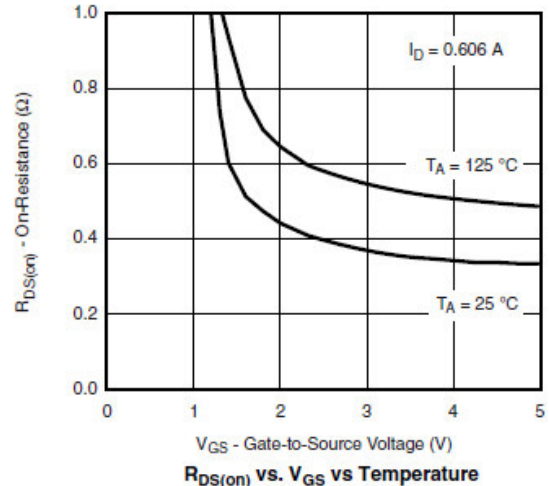
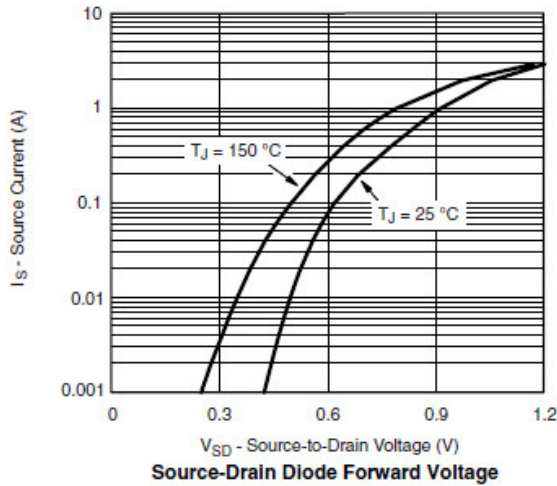
Gate Charge



On-Resistance vs. Junction Temperature



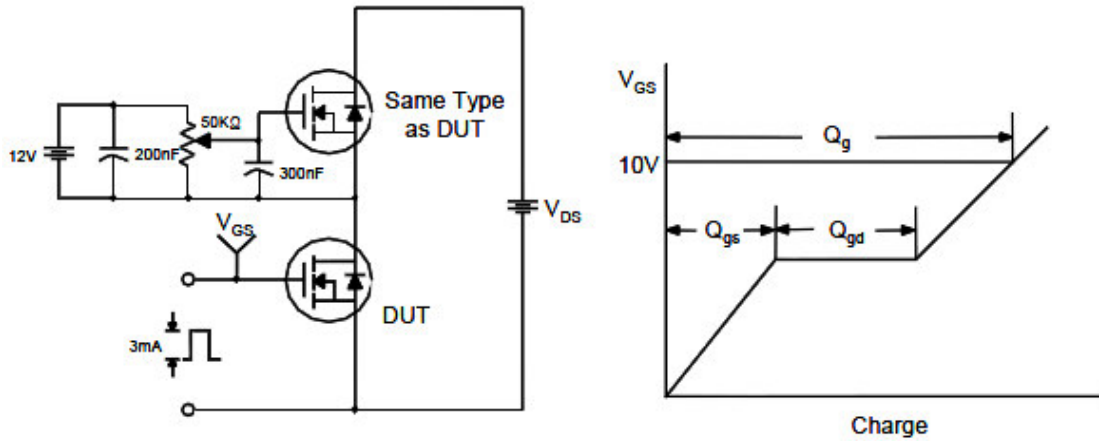
## Typical Characteristics ( N-Channel )



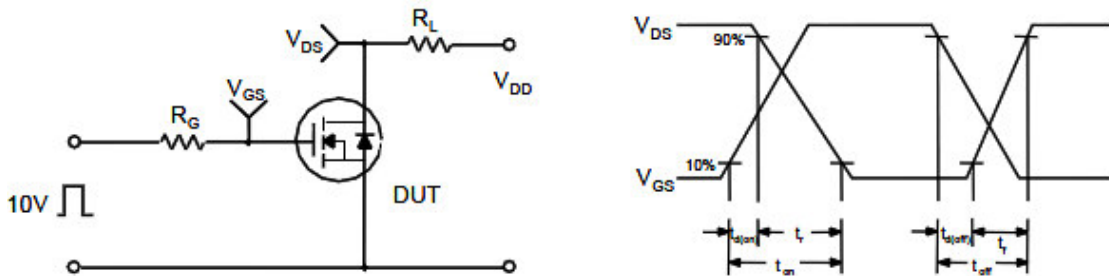


**Typical Characteristics ( N-Channel )**

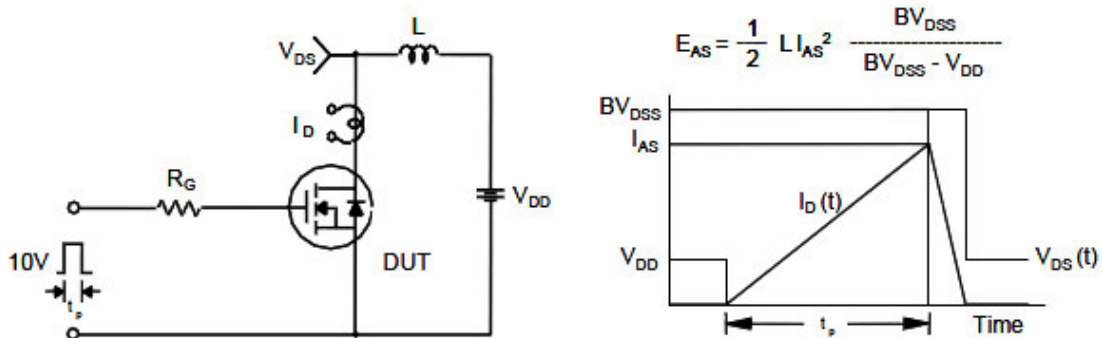
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

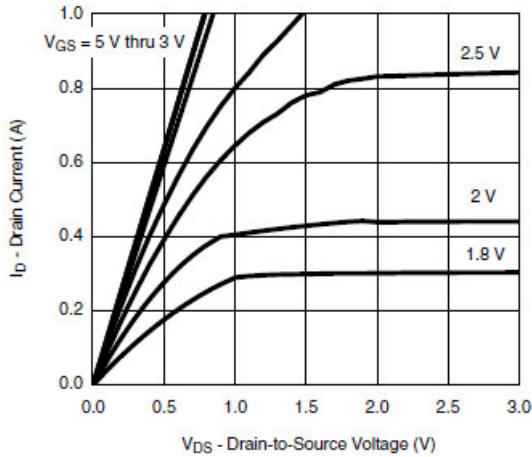


Unclamped Inductive Switching Test Circuit & Waveforms

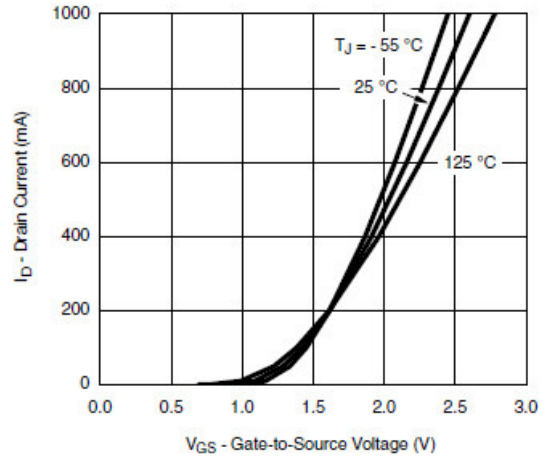




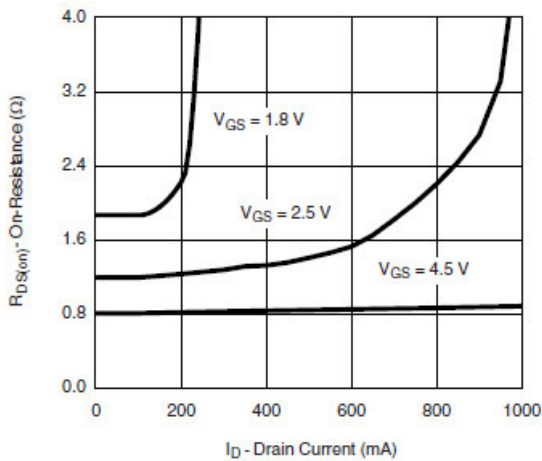
## Typical Characteristics ( P-Channel )



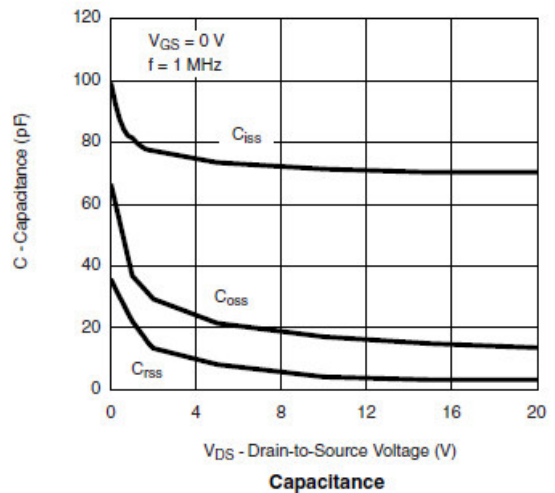
Output Characteristics



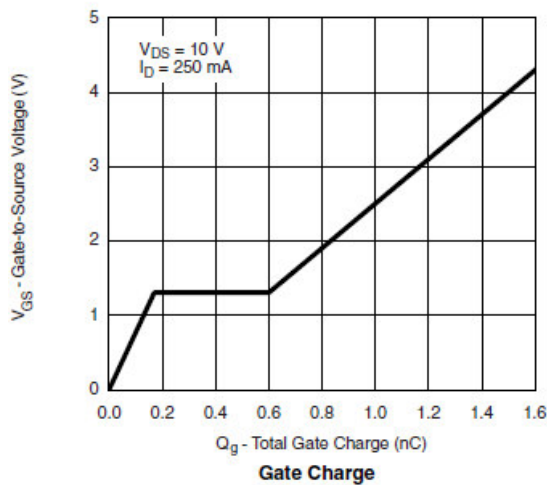
Transfer Characteristics



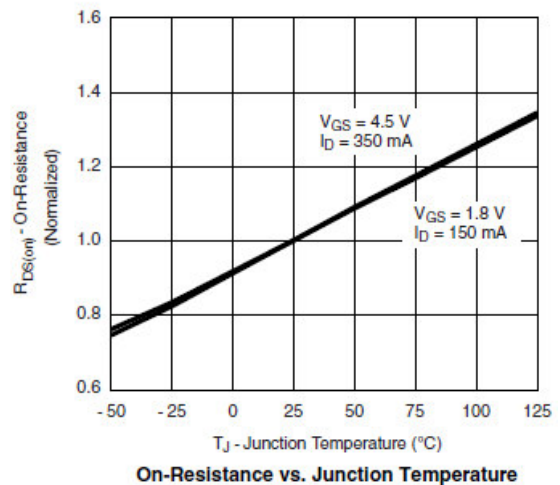
On-Resistance vs. Drain Current



Capacitance



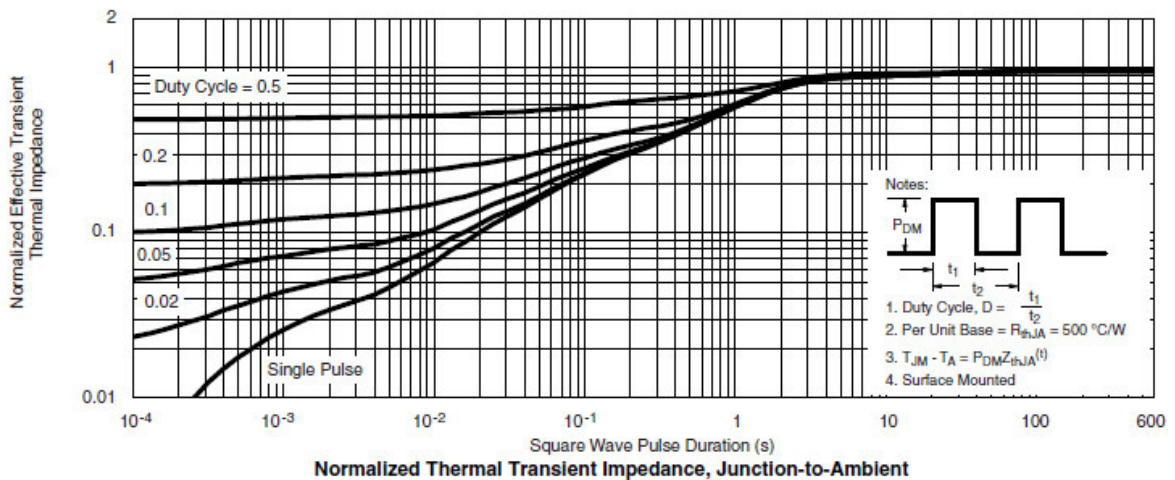
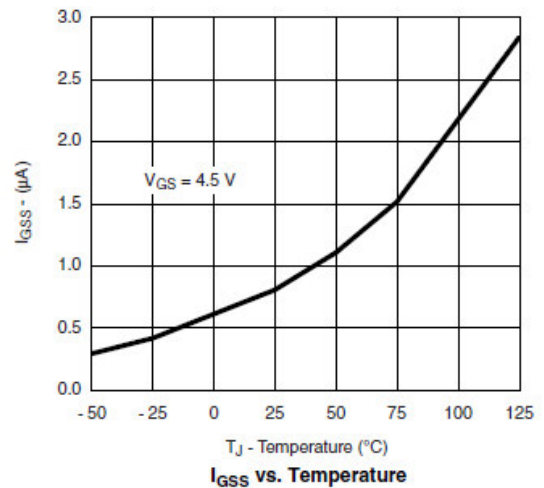
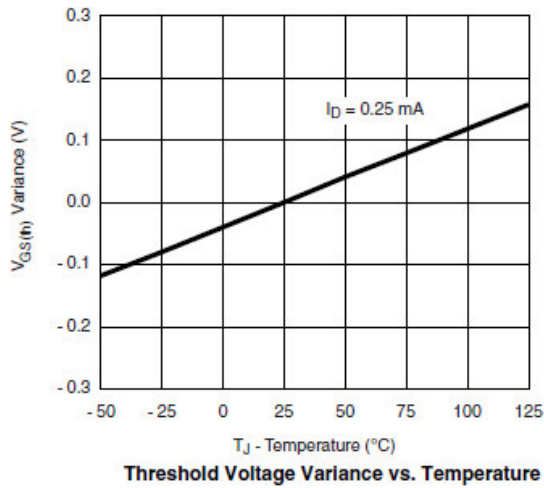
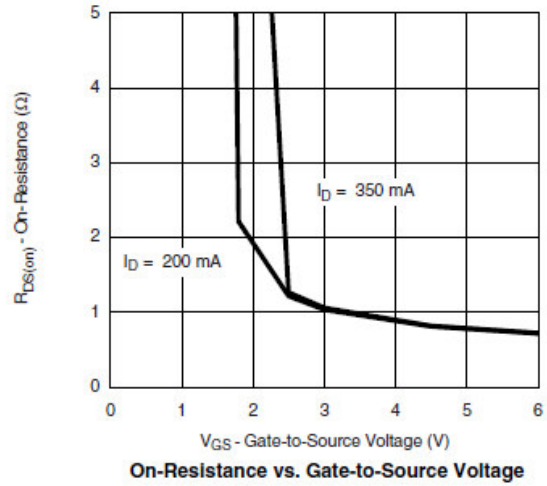
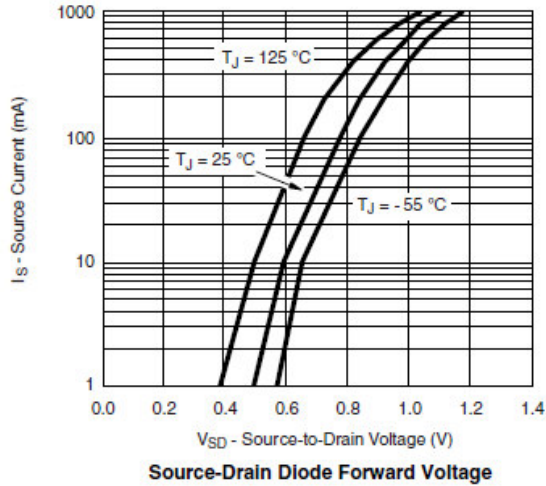
Gate Charge



On-Resistance vs. Junction Temperature



## Typical Characteristics ( P-Channel )

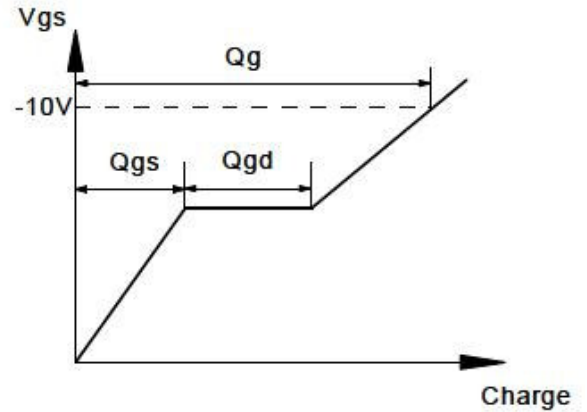
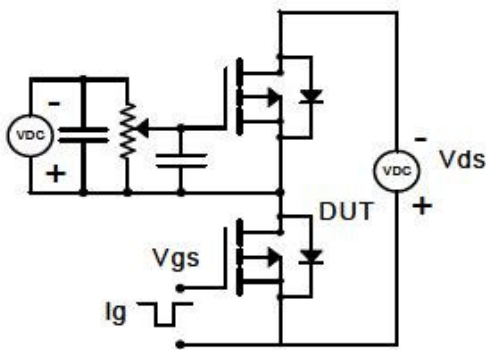




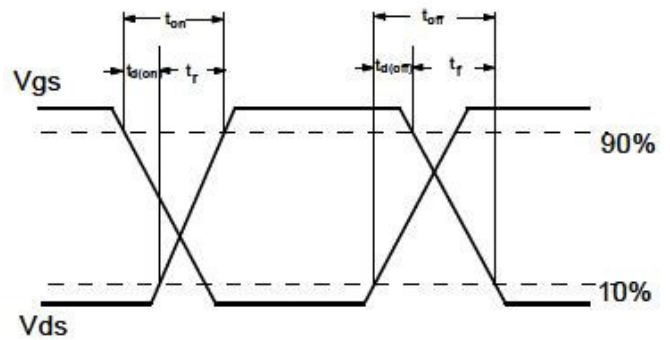
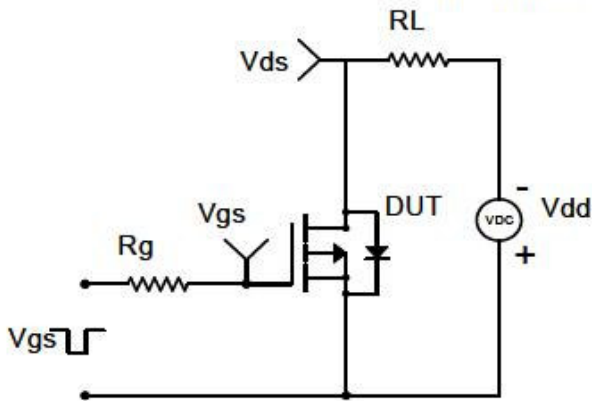


## Typical Characteristics ( P-Channel )

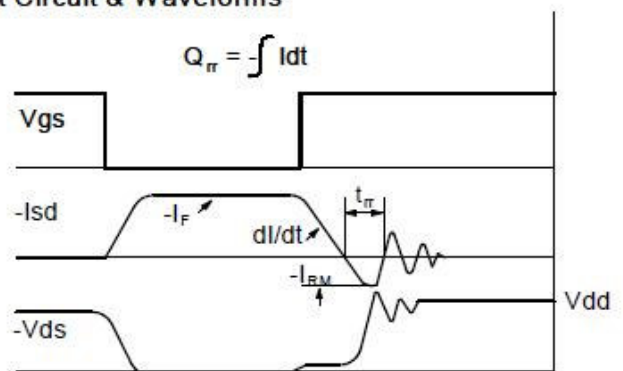
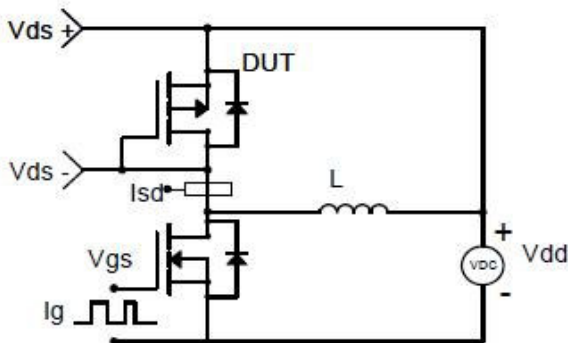
### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms

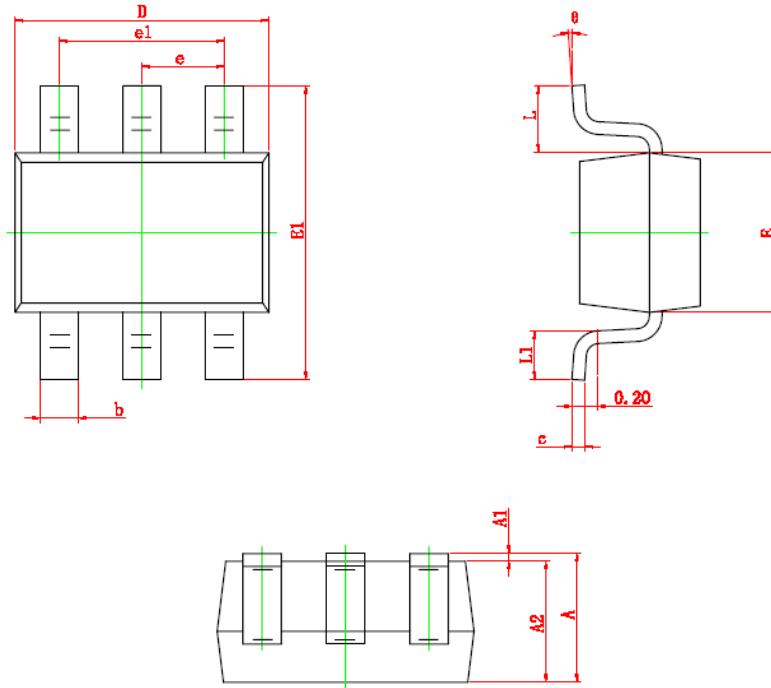


### Diode Recovery Test Circuit & Waveforms





**Package Information ( SOT-363 )**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

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