



General Description

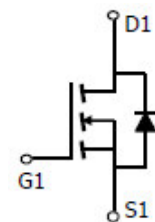
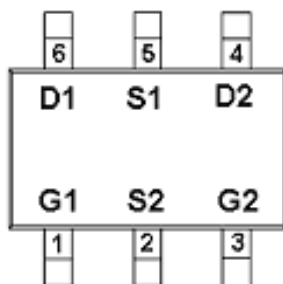
AFC6601, N & P Pair enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

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

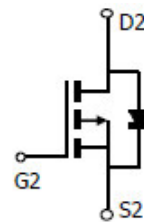
Features

- N-Channel
30V/3.4A, $R_{DS(ON)}=68m\Omega@V_{GS}=10V$
30V/3.0A, $R_{DS(ON)}=74m\Omega@V_{GS}=4.5V$
30V/2.0A, $R_{DS(ON)}=90m\Omega@V_{GS}=2.5V$
- P-Channel
-30V/-2.6A, $R_{DS(ON)}=115m\Omega@V_{GS}=-10.0V$
-30V/-2.0A, $R_{DS(ON)}=150m\Omega@V_{GS}=-4.5V$
-30V/-1.2A, $R_{DS(ON)}=235m\Omega@V_{GS}=-2.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- TSOP-6 package design

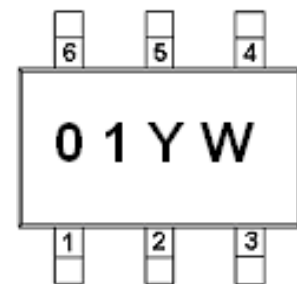
Pin Description (TSOP-6)



n-channel



p-channel



Application

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter



Pin Define

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

Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFC6601TS6RG	01YW	TSOP-6	Tape & Reel	3000 EA

- ※ 01 parts code
- ※ Y year code (0 ~ 9)
- ※ W week code (A ~ Z = 1 ~ 26 / a ~ z = 27 ~ 52)
- ※ AFC6601TS6RG : 7" Tape & Reel ; Pb- Free ; Halogen- Free

Absolute Maximum Ratings

($T_A=25^{\circ}\text{C}$ Unless otherwise noted)

Parameter	Symbol	Typical		Unit	
		N-Channel	P-Channel		
Drain-Source Voltage	V_{DSS}	-30	-30	V	
Gate -Source Voltage	V_{GSS}	± 20	± 12	V	
Continuous Drain Current($T_J=150^{\circ}\text{C}$)	I_D	$T_A=25^{\circ}\text{C}$	-3.0	-2.6	A
		$T_A=70^{\circ}\text{C}$	-1.2	-1.2	
Pulsed Drain Current	I_{DM}	-15	-15	A	
Continuous Source Current(Diode Conduction)	I_S	-1.5	-1.5	A	
Power Dissipation	P_D	$T_A=25^{\circ}\text{C}$	2.0	W	
		$T_A=70^{\circ}\text{C}$	1.3		
Operating Junction Temperature	T_J	150		$^{\circ}\text{C}$	
Storage Temperature Range	T_{STG}	-55/150		$^{\circ}\text{C}$	
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	120		$^{\circ}\text{C}/\text{W}$	



Electrical Characteristics (N-Channel)

(T_A=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250uA	30			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	0.3		1.0	
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±12V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =24V, V _{GS} =0V			1	uA
		V _{DS} =24V, V _{GS} =0V T _J =85°C			30	
On-State Drain Current	I _{D(on)}	V _{DS} ≥5V, V _{GS} =4.5V	30			A
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =3.4A		58	68	mΩ
		V _{GS} =4.5V, I _D =3.0A		62	74	
		V _{GS} =2.5V, I _D =2.0A		76	90	
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =1.6A		20		S
Diode Forward Voltage	V _{SD}	I _S =1.7A, V _{GS} =0V		0.8	1.2	V
Dynamic						
Total Gate Charge	Q _g	V _{DS} =15V, V _{GS} =4.5V I _D ≅3.6A		2.3	3	nC
Gate-Source Charge	Q _{gs}			1.0		
Gate-Drain Charge	Q _{gd}			0.6		
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V f=1MHz		280		pF
Output Capacitance	C _{oss}			40		
Reverse Transfer Capacitance	C _{rss}			20		
Turn-On Time	t _{d(on)}	V _{DD} =15V, R _L =15Ω I _D ≅1.0A, V _{GEN} =10V R _G =6Ω		10	15	ns
	t _r			12	20	
Turn-Off Time	t _{d(off)}			15	25	
	t _f			10	15	



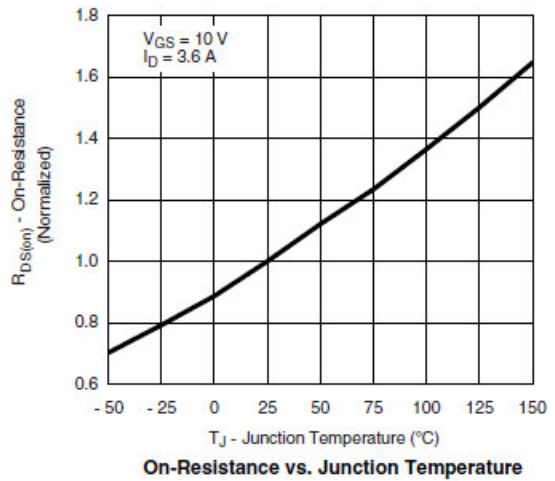
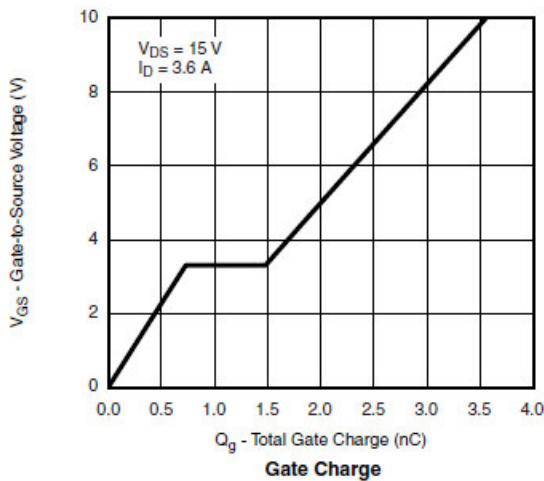
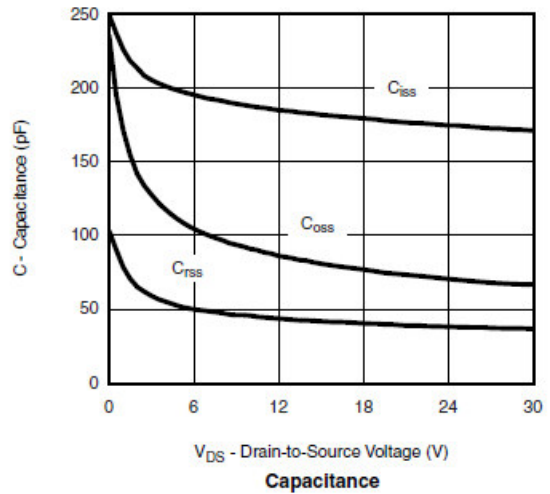
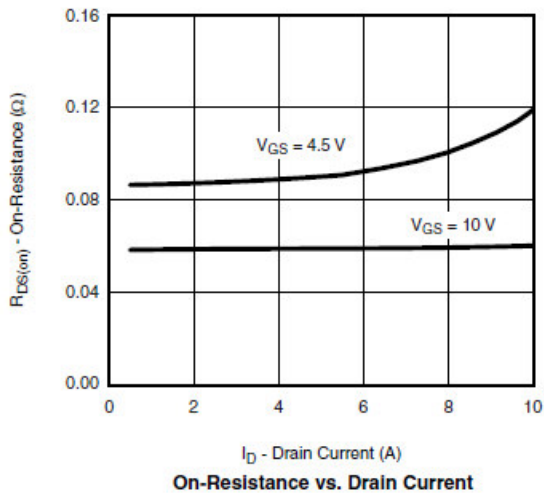
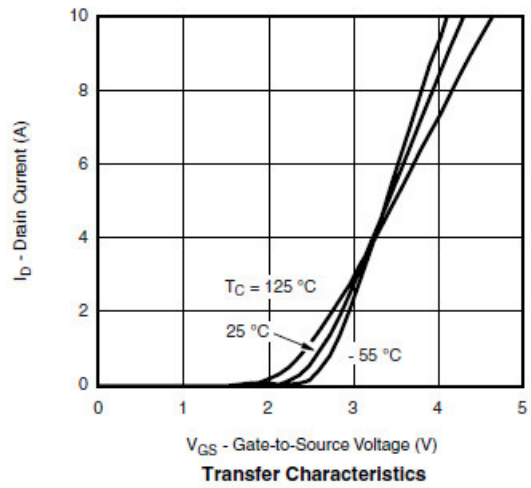
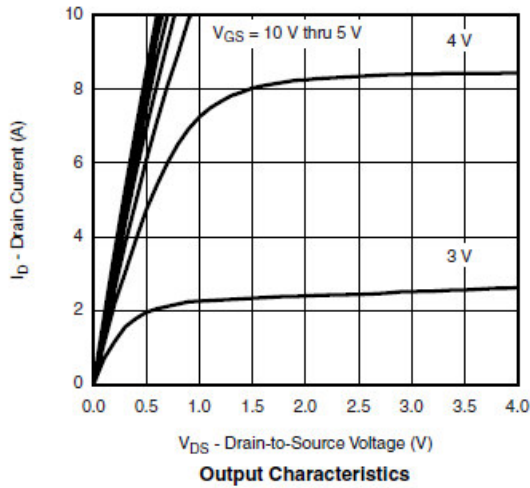
Electrical Characteristics (P-Channel)

(T_A=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =-250uA	-30			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250uA	-0.6		-1.4	
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±12V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-24V, V _{GS} =0V			-1	uA
		V _{DS} =-24V, V _{GS} =0V T _A =85°C			-30	
On-State Drain Current	I _{D(on)}	V _{DS} ≤ -5V, V _{GS} =-10V	-10			A
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-2.6A		102	115	mΩ
		V _{GS} =-4.5V, I _D =-2.0A		132	150	
		V _{GS} =-2.5V, I _D =-1.2A		218	235	
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-4.0A		10		S
Diode Forward Voltage	V _{SD}	I _S =-1.7A, V _{GS} =0V		-0.7	-1.3	V
Dynamic						
Total Gate Charge	Q _g	V _{DS} =-15V, V _{GS} =-4.5V I _D ≡-2.0A		4	6	nC
Gate-Source Charge	Q _{gs}			0.6		
Gate-Drain Charge	Q _{gd}			1.5		
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V f=1MHz		230		pF
Output Capacitance	C _{oss}			40		
Reverse Transfer Capacitance	C _{rss}			25		
Turn-On Time	t _{d(on)}	V _{DD} =-15V, R _L =15Ω I _D ≡-1.0A, V _{GEN} =-10V R _G =6Ω		5	10	ns
	t _r			8	15	
Turn-Off Time	t _{d(off)}			15	30	
	t _f			15	30	

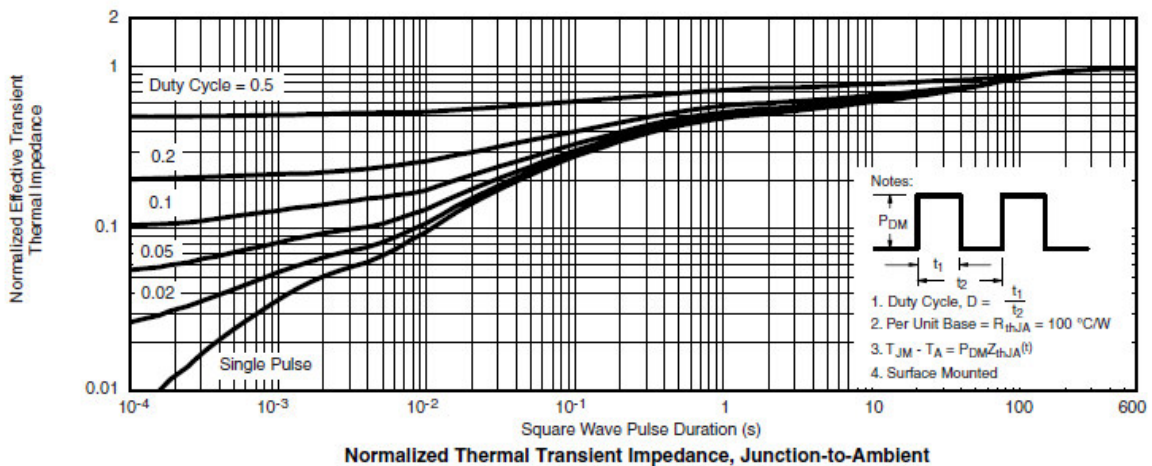
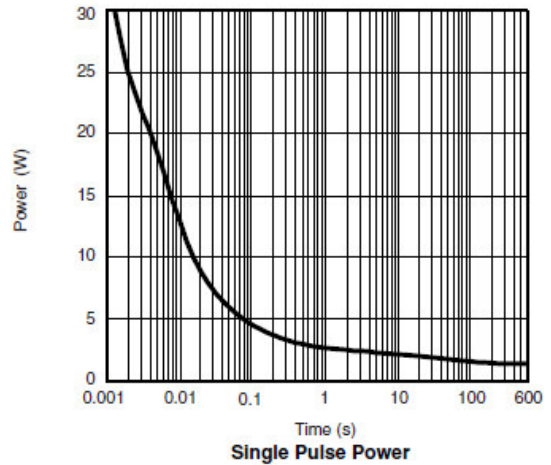
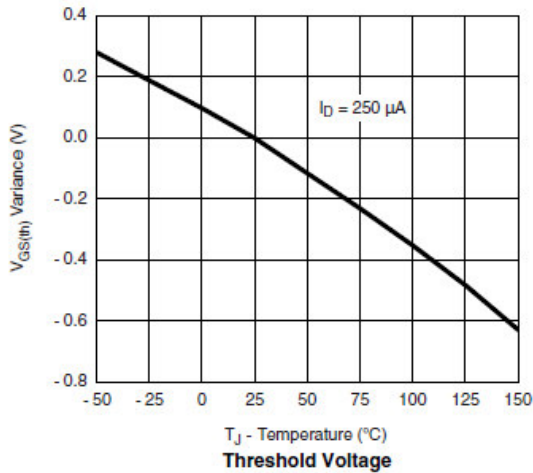
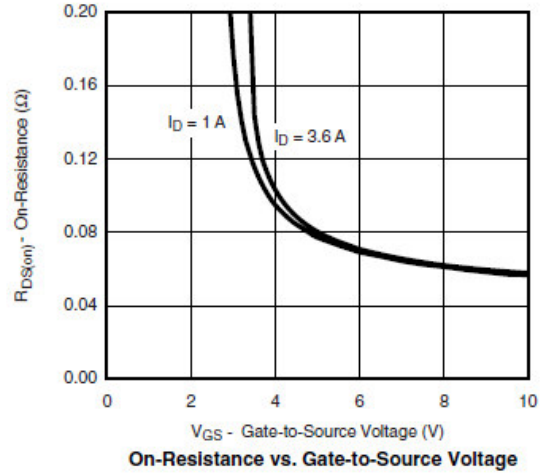
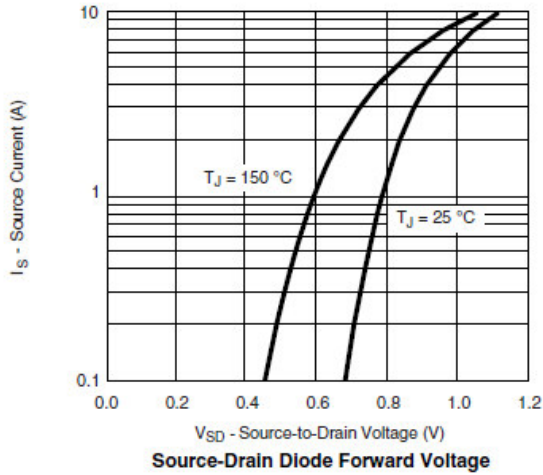


Typical Characteristics (N-Channel)





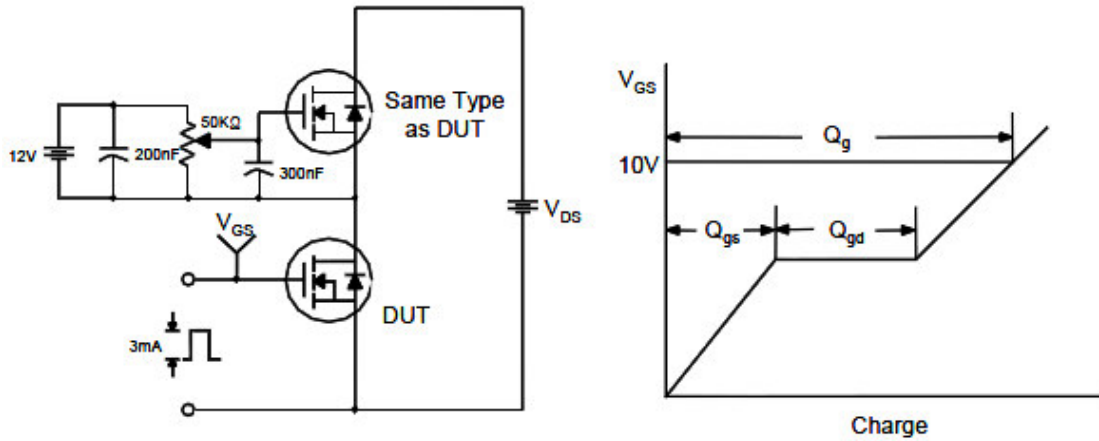
Typical Characteristics (N-Channel)



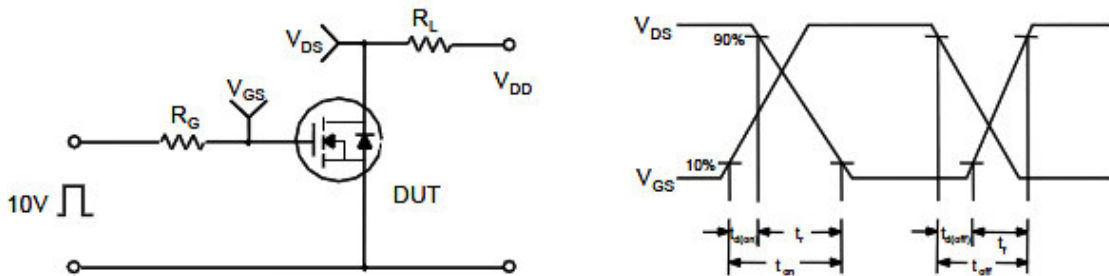


Typical Characteristics (N-Channel)

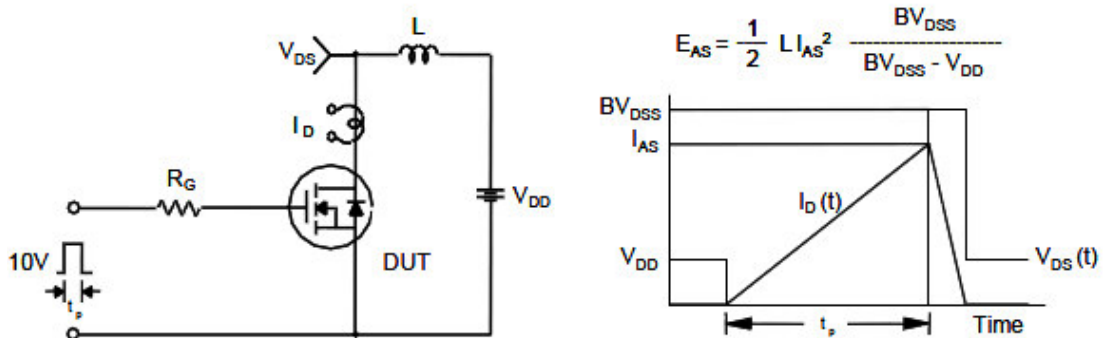
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

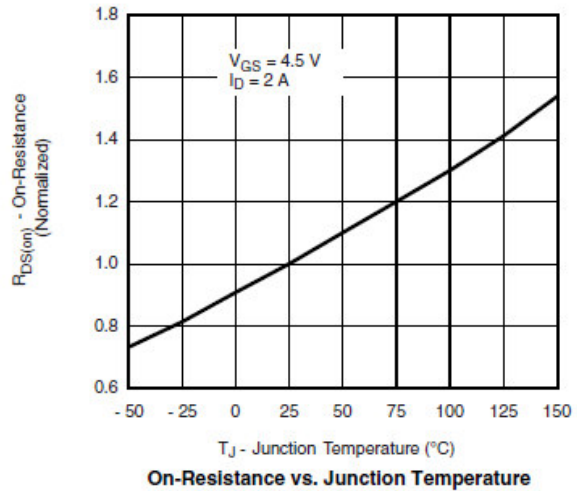
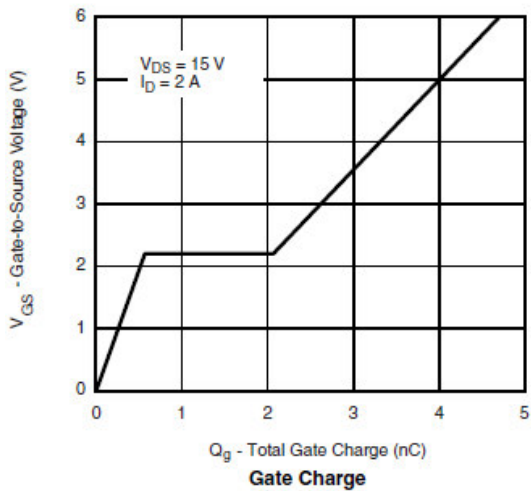
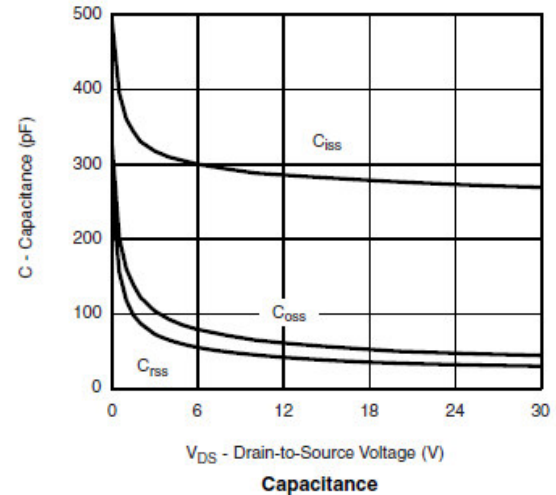
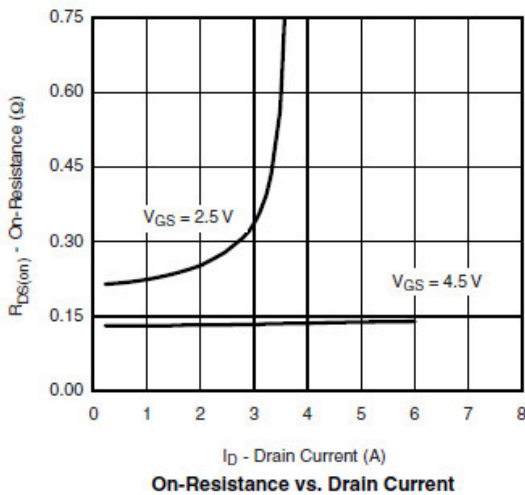
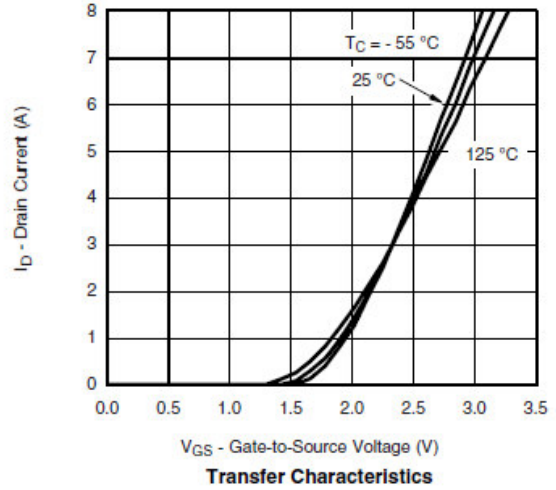
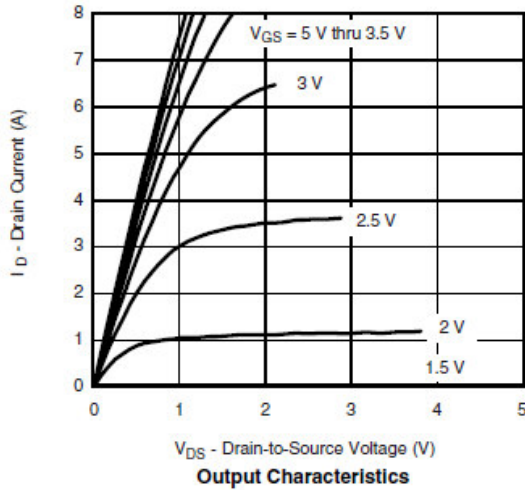


Unclamped Inductive Switching Test Circuit & Waveforms



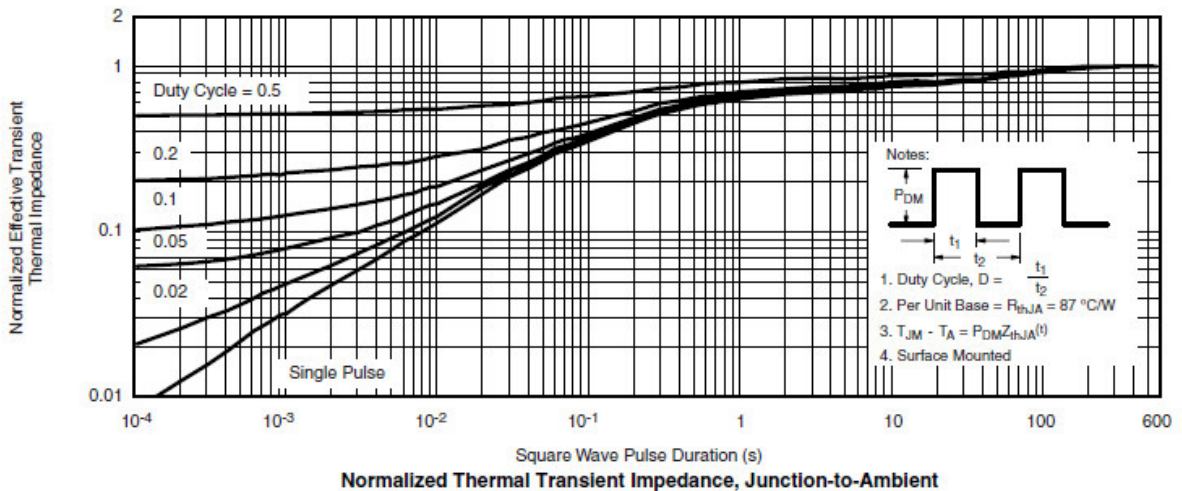
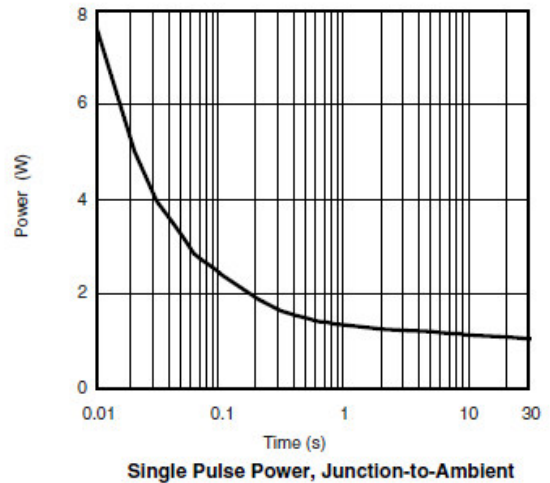
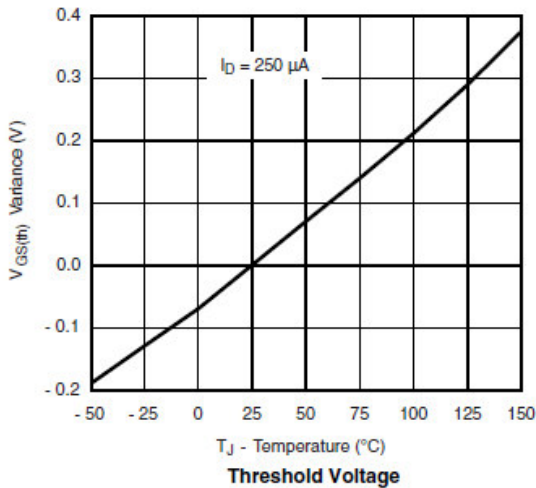
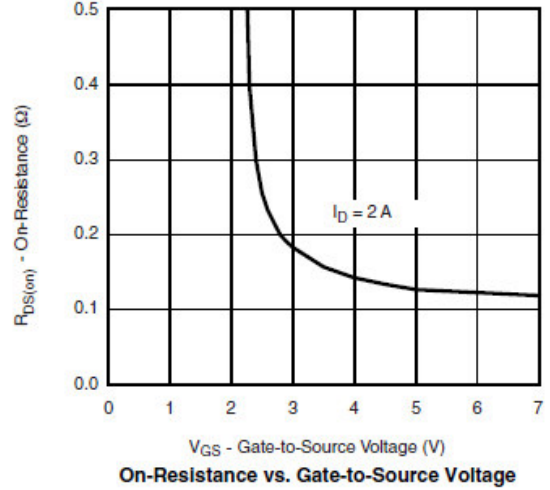
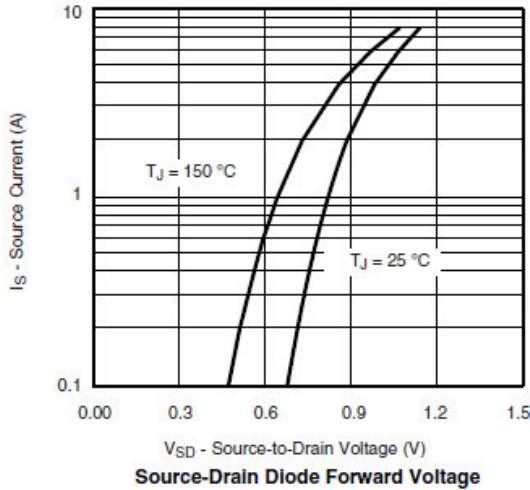


Typical Characteristics (P-Channel)





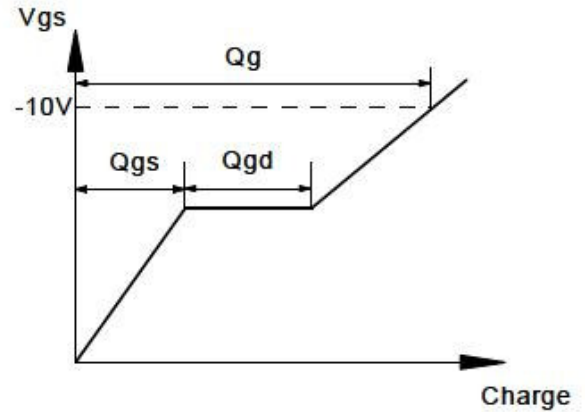
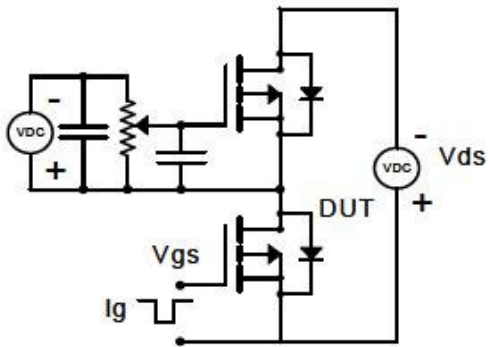
Typical Characteristics (P-Channel)



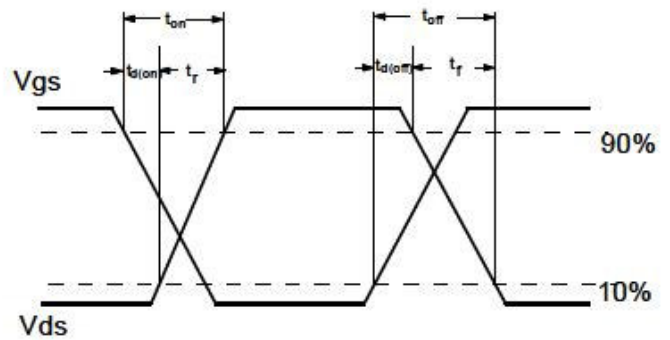
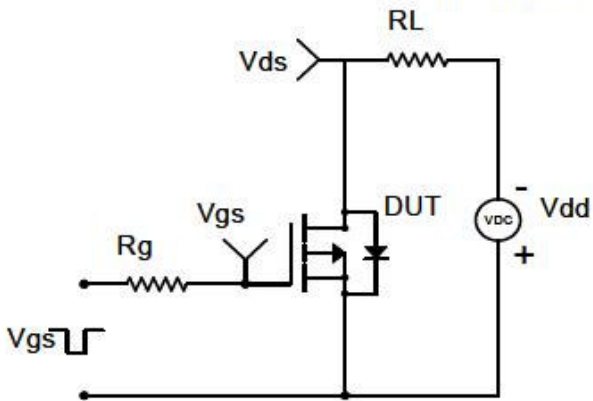


Typical Characteristics

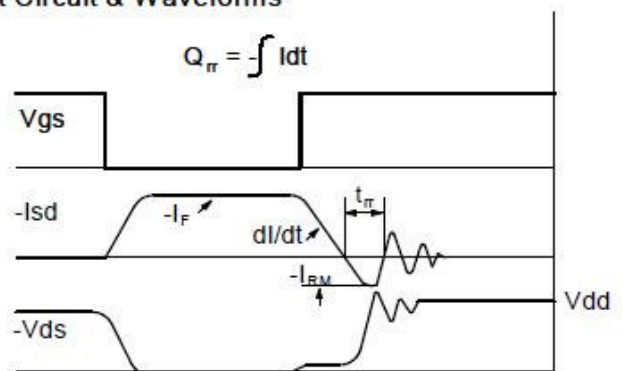
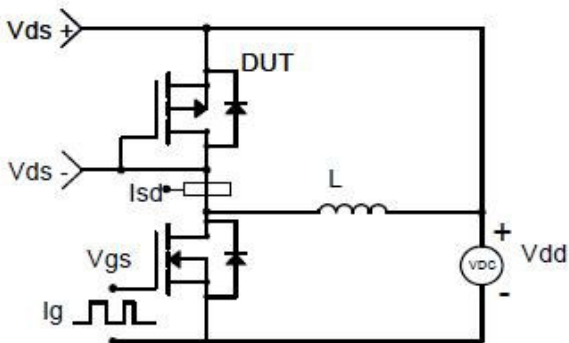
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

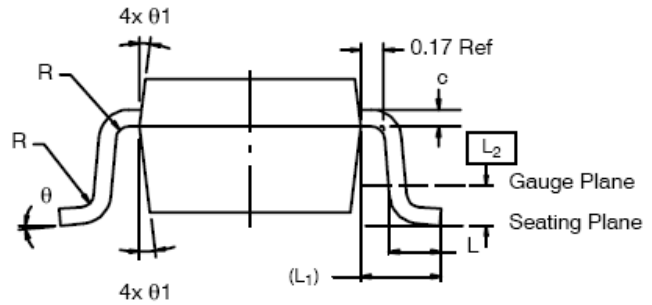
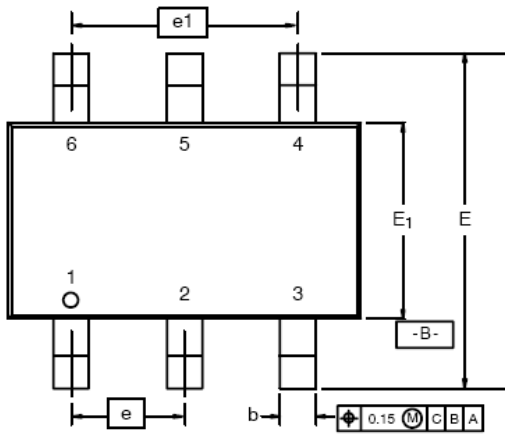


Diode Recovery Test Circuit & Waveforms





Package Information (TSOP-6)



Dim	MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max
A	0.91	-	1.10	0.036	-	0.043
A ₁	0.01	-	0.10	0.0004	-	0.004
A ₂	0.90	-	1.00	0.035	0.038	0.039
b	0.30	0.32	0.45	0.012	0.013	0.018
c	0.10	0.15	0.20	0.004	0.006	0.008
D	2.95	3.05	3.10	0.116	0.120	0.122
E	2.70	2.85	2.96	0.106	0.112	0.117
E ₁	1.55	1.65	1.70	0.061	0.065	0.067
e	1.00 BSC			0.0394 BSC		
e ₁	1.90	2.00	2.10	0.075	0.080	0.085
L	0.35	-	0.50	0.014	-	0.020
L ₁	0.60 Ref			0.024 Ref		
L ₂	0.25 BSC			0.010 BSC		
R	0.10	-	-	0.004	-	-
θ	0°	4°	8°	0°	4°	8°
θ ₁	7° Nom			7° Nom		

©2010 Alfa-MOS Technology Corp.
 2F, No.80, Sec.1, Cheng Kung Rd., Nan Kang Dist., Taipei City 115, Taiwan (R.O.C.)
 Tel : 886 2) 2651 3928
 Fax : 886 2) 2786 8483
 ©http://www.alfa-mos.com