GSM6332

N & P Pair Enhancement Mode MOSFET

Product Description

The GSM6332 is the N and 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.

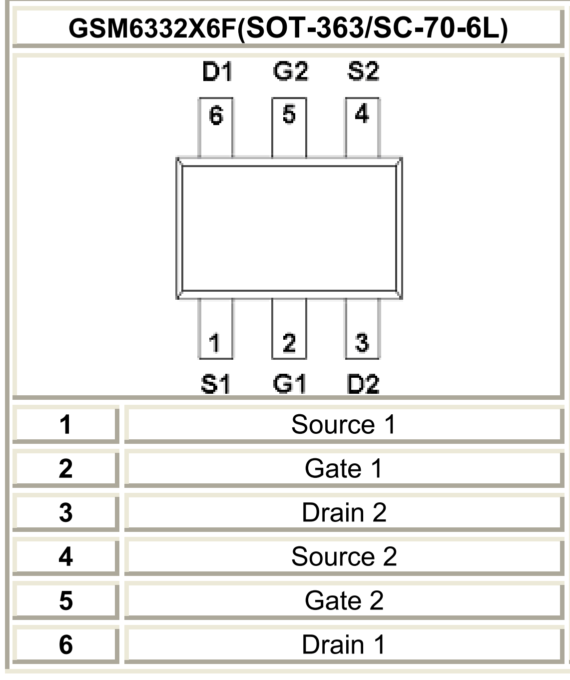
Features

- N-Channel
  20V/1.0A,$R_{DS(ON)}$=280mΩ@V_{GS}=4.5V
  20V/0.8A,$R_{DS(ON)}$=340mΩ@V_{GS}=2.5V
  20V/0.7A,$R_{DS(ON)}$=580mΩ@V_{GS}=1.8V
- P-Channel
  -20V/-1.0A,$R_{DS(ON)}$= 600mΩ@V_{GS}=-4.5V
  -20V/-0.8A,$R_{DS(ON)}$= 800mΩ@V_{GS}=-2.5V
  -20V/-0.7A,$R_{DS(ON)}$= 1440mΩ@V_{GS}=-1.8V
- Low-Voltage Operation
- High-Speed Circuits
- Low Battery Voltage Operation
- SOT-363 package design

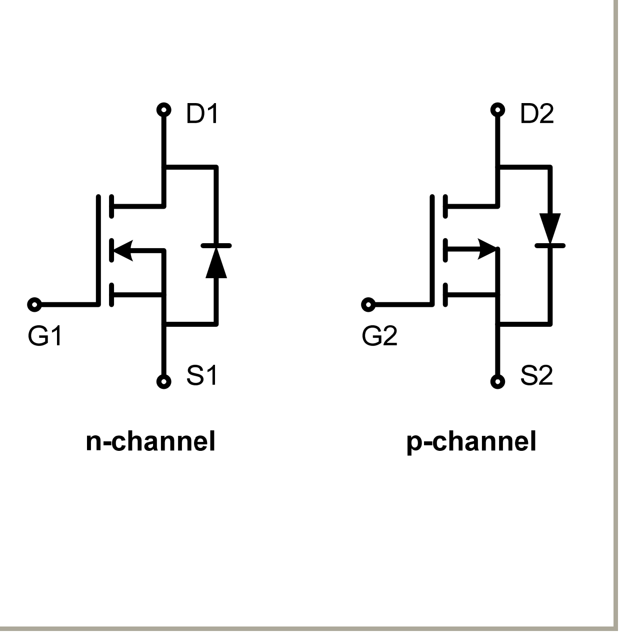
Applications

- Load Switch for Portable Devices, Smart Phones, Pagers.

Packages & Pin Assignments

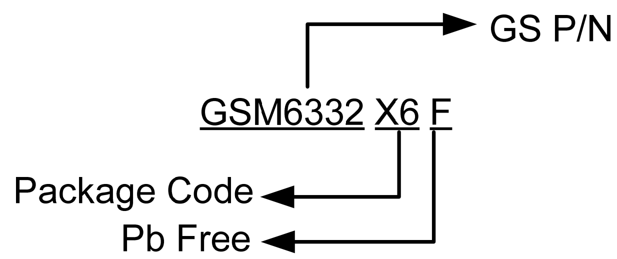


1	Source 1
2	Gate 1
3	Drain 2
4	Source 2
5	Gate 2
6	Drain 1

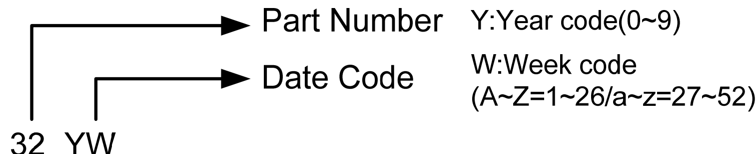


GSM6332

Ordering Information



Marking Information



Y:Year code(0~9)
W:Week code
(A~Z=1~26/a~z=27~52)

Part Number	Package	Part Marking
GSM6332X6F	SOT-363	32YW

Absolute Maximum Ratings

T_A=25°C unless otherwise noted

Symbol	Parameter		Typical		Unit
			N-Channel	P-Channel	
V_{DSS}	Drain-Source Voltage		20	-20	V
V_{GSS}	Gate –Source Voltage		±12	±12	V
I_D	Continuous Drain Current(T_J=150°C)	T_A =25°C	1.0	-1.0	A
		T_A =70°C	0.7	-0.7	
I_{DM}	Pulsed Drain Current		6	-6	A
I_S	Continuous Source Current(Diode Conduction)		1	-1	A
PD	Power Dissipation	T_A =25°C	0.3		W
		T_A =70°C	0.2		
T_J	Operating Junction Temperature		-55/150		°C
T_{STG}	Storage Temperature Range		-55/150		°C

Electrical Characteristics

T_A=25ºC unless otherwise noted

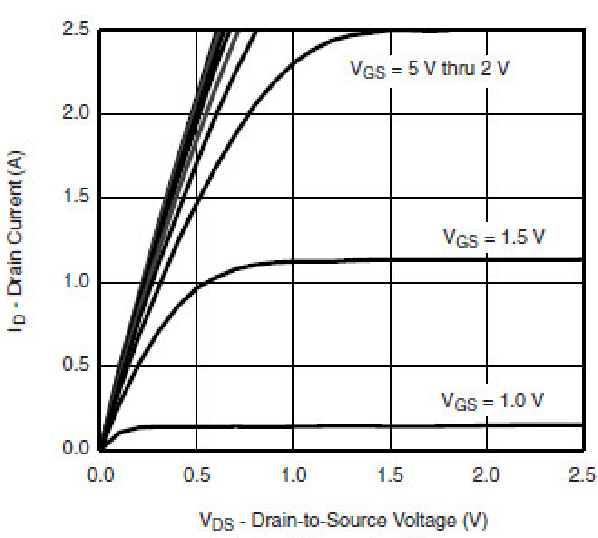
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static							
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D= 250uA	N-Ch	20			V
		V_{GS}=0V,I_D=-250uA	P-Ch	-20			
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D= 250uA	N-Ch	0.4		1.0	
		V_{DS}=V_{GS},I_D= -250uA	P-Ch	-0.4		-1.0	
I_{GSS}	Gate Leakage Current	V_{DS}=0V,V_{GS}= ±12V	N-Ch			±100	nA
		V_{DS}=0V,V_{GS}= ±12V	P-Ch			±100	
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V,V_{GS}=0V	N-Ch			1	uA
		V_{DS}= -20V,V_{GS}=0V	P-Ch			-1	
		V_{DS}= 20V,V_{GS}=0V T_J=85ºC	N-Ch			5	
		V_{DS}= -20V,V_{GS}=0V T_J=85ºC	P-Ch			-5	
$I_{D(on)}$	On-State Drain Current	V_{DS}≥5V,V_{GS}= 4.5V	N-Ch	1.2			A
		V_{DS}≤-5V,V_{GS}= 4.5V	P-Ch	0.7			
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=4.5V,I_D= 1.0A	N-Ch			280	mΩ
		V_{GS}= -4.5V,I_D= -1.0A	P-Ch			600	
		V_{GS}= 2.5V,I_D= 0.8A	N-Ch			340	
		V_{GS}= -2.5V,I_D=-0.8A	P-Ch			800	
		V_{GS}= 1.8V,I_D= 0.7A	N-Ch			580	
		V_{GS}= -1.8V,I_D= -0.7A	P-Ch			1440	
g_{fs}	Forward Transconductance	V_{DS}= 10V,I_D= 1.0A	N-Ch		1		S
		V_{DS}= -10V,I_D= -0.4A	P-Ch		1		
V_{SD}	Diode Forward Voltage	I_S= 1.0A,V_{GS}=0V	N-Ch		0.65	1.2	V
		I_S= -0.15A,V_{GS}=0V	P-Ch		-0.65	-1.2	
Dynamic							
C_{iss}	Input Capacitance	V_{DS}=10V,V_{GS}=0V f=1MHz	N-Ch		70		pF
		V_{DS}=-10V,V_{GS}=0V f=1MHz	P-Ch		70		
C_{oss}	Output Capacitance	V_{DS}=10V,V_{GS}=0V f=1MHz	N-Ch		20		
		V_{DS}=-10V,V_{GS}=0V f=1MHz	P-Ch		20		
C_{rss}	Reverse Transfer Capacitance	V_{DS}=10V,V_{GS}=0V f=1MHz	N-Ch		8		
		V_{DS}=-10V,V_{GS}=0V f=1MHz	P-Ch		10		
Q_g	Total Gate Charge	N-Channel V_{DS}=10V,V_{GS}=4.5V, I_D≡1.2A P-Channel V_{DS}=-10V,V_{GS}=-4.5V , I_D≡-0.25A	N-Ch		1.06	1.38	nC
			P-Ch		1.0	1.3	
Q_{gs}	Gate-Source Charge		N-Ch		0.18		
			P-Ch		0.1		
Q_{gd}	Gate-Drain Charge		N-Ch		0.32		
			P-Ch		0.3		

Electrical Characteristics (Continue)

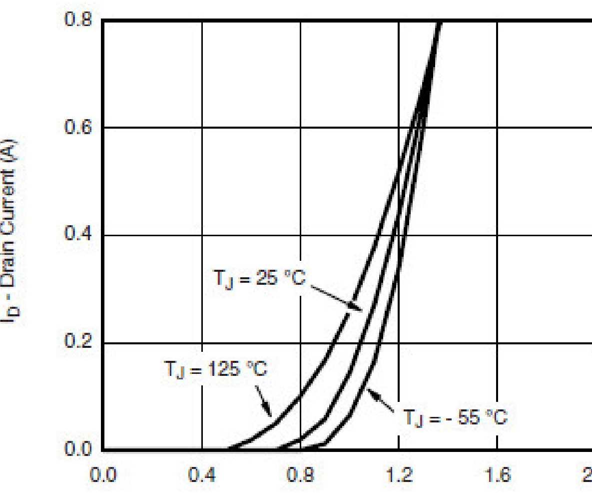
T_A=25ºC unless otherwise noted

$t_{d(on)}$	Turn-On Time	N-Channel V_{DD}=10V,R_L=20Ω ,I_D≡1.2A V_{GEN}=4.5V ,R_G=1Ω P-Channel V_{DD}=-10V,R_L=30Ω ,I_D≡-0.2A V_{GEN}=-4.5V ,R_G=10Ω	N-Ch		18	26	ns
			P-Ch		10	15	
t_r			N-Ch		20	28	
			P-Ch		10	15	
$t_{d(off)}$	Turn-Off Time		N-Ch		70	110	
			P-Ch		40	60	
t_f			N-Ch		25	40	
			P-Ch		30	50	

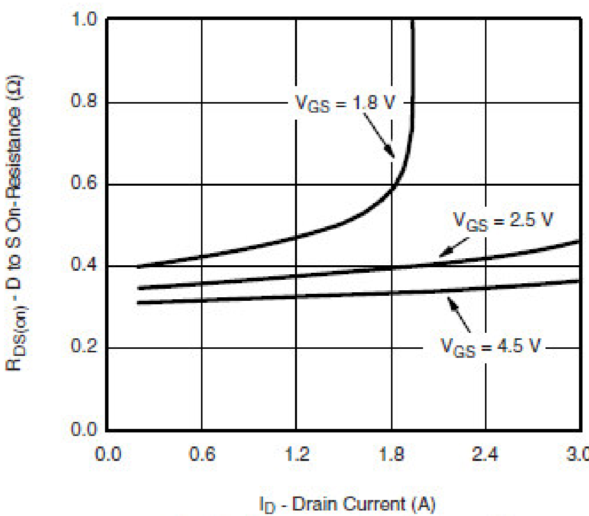
Typical Performance Characteristics (N-Channel)



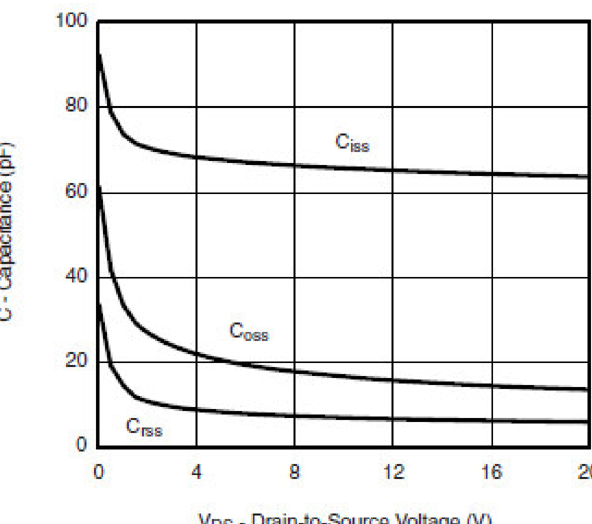
Output Characteristics



Transfer Characteristics

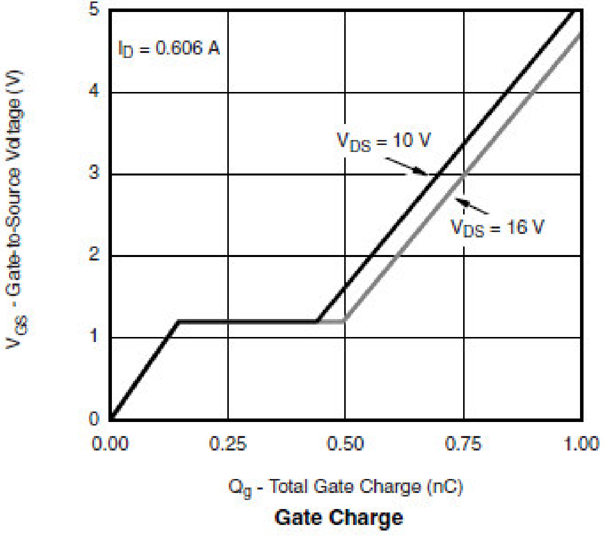


On-Resistance vs. Drain Current

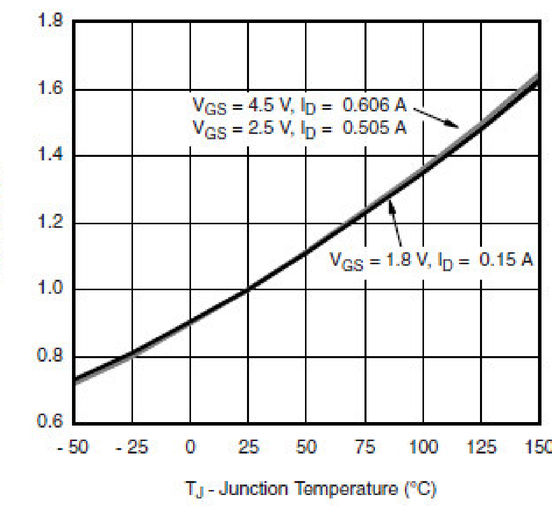


Capacitance

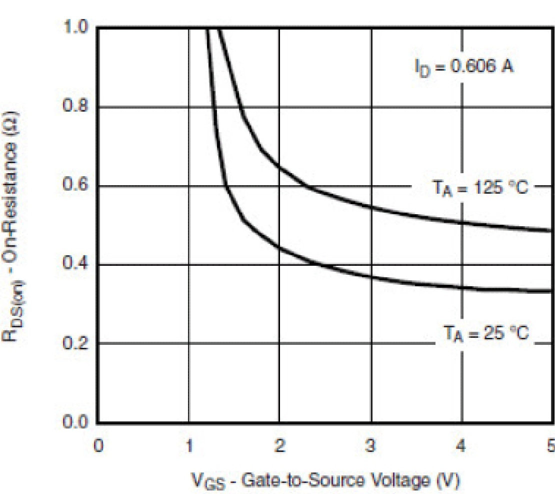
Typical Performance Characteristics (N-Channel)



Gate Charge



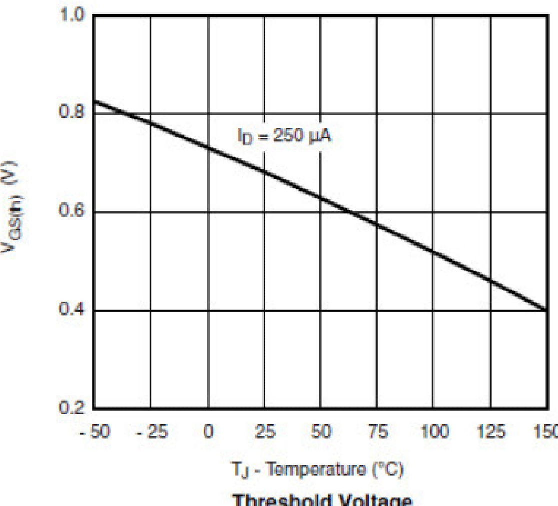
On-Resistance vs. Junction Temperature



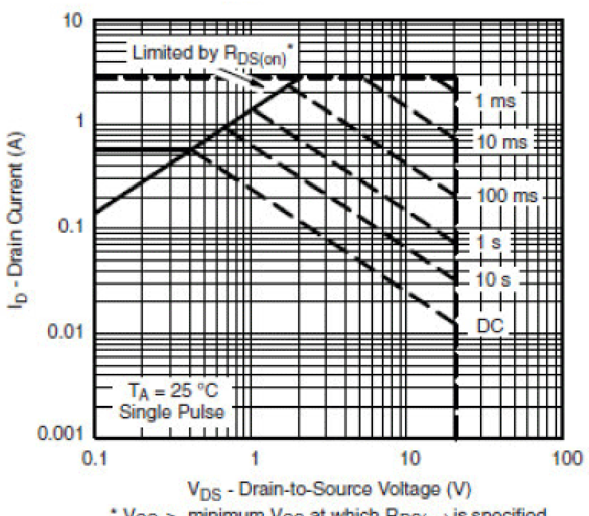
Source-Drain Diode Forward Voltage

I_S - Source Current (A)
T_J = 150 °C
T_J = 25 °C
V_{SD} - Source-to-Drain Voltage (V)

$R_{DS(on)}$ vs. V_{GS} vs Temperature



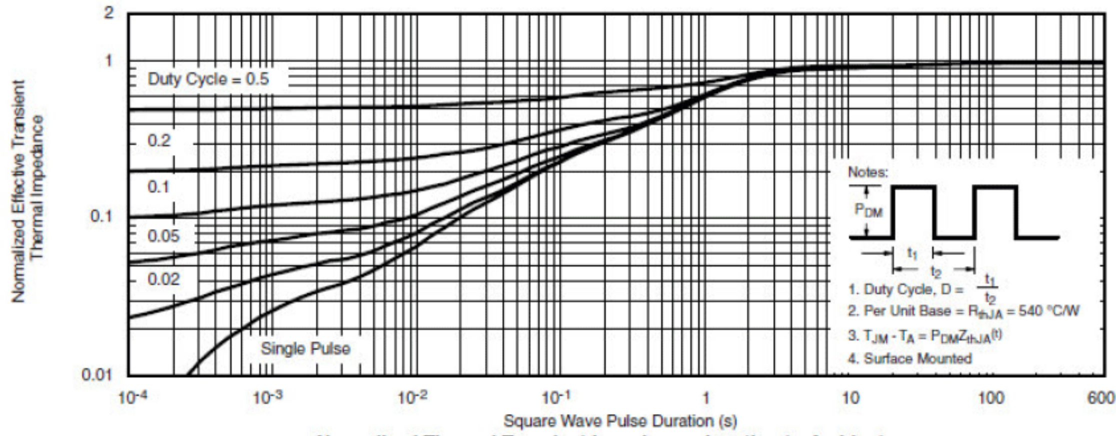
Threshold Voltage

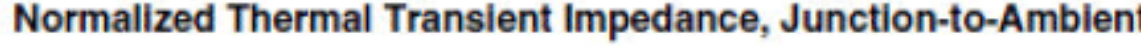


* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

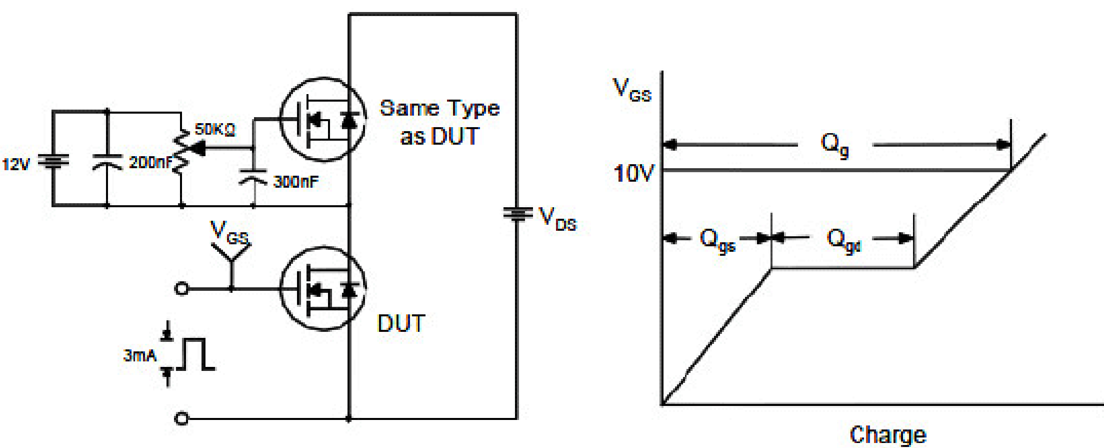
Typical Performance Characteristics (N-Channel)



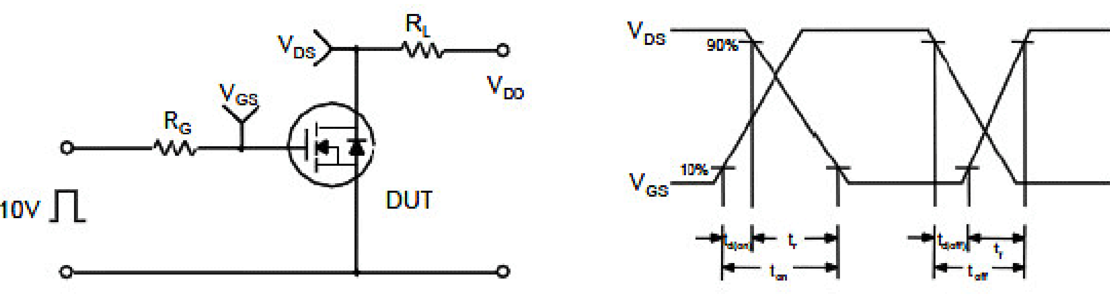


Typical Performance Characteristics (N-Channel)

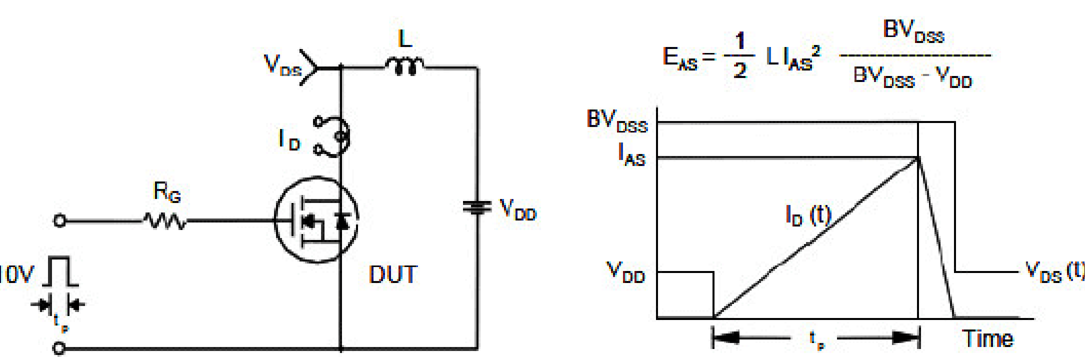
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Typical Performance Characteristics (P-Channel)

Output Characteristics

Transfer Characteristics

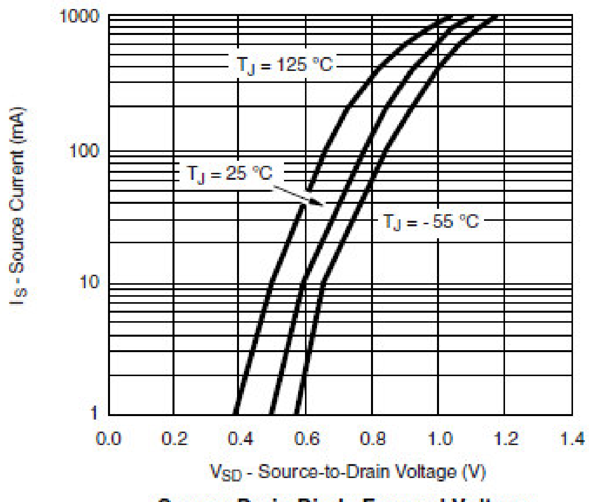
On-Resistance vs. Drain Current

Capacitance

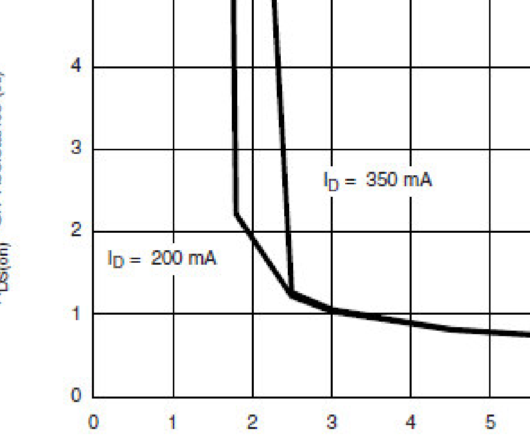
Gate Charge

On-Resistance vs. Junction Temperature

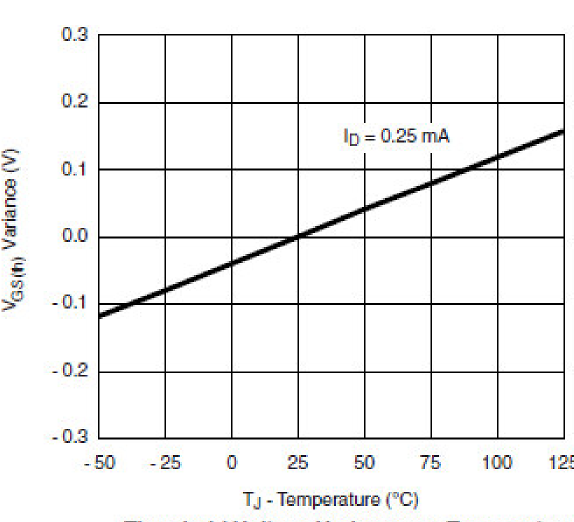
Typical Performance Characteristics (P-Channel)



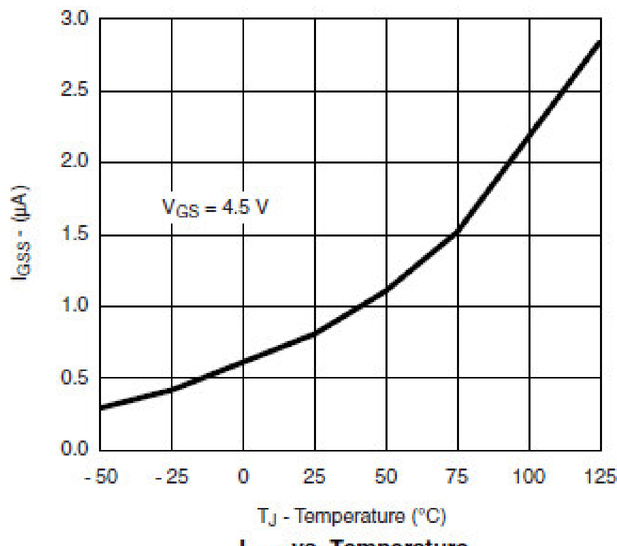
Source-Drain Diode Forward Voltage



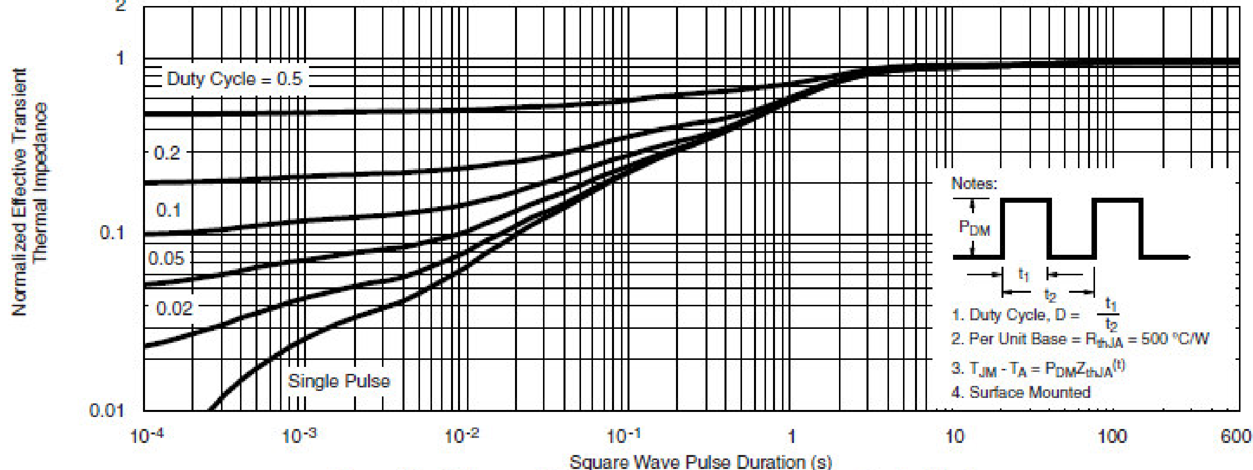
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage Variance vs. Temperature



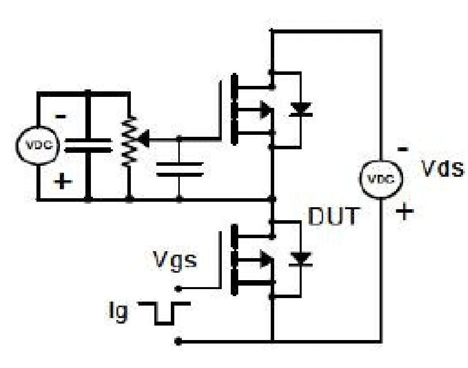
I_{GSS} vs. Temperature

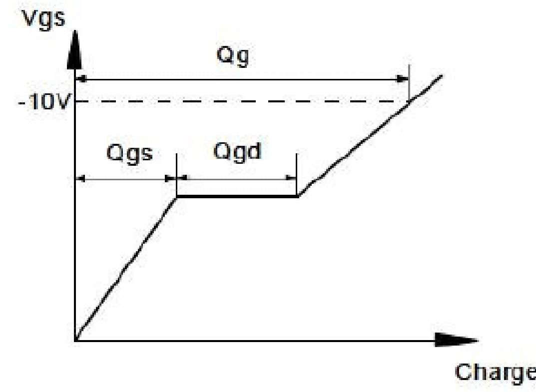


Normalized Thermal Transient Impedance, Junction-to-Ambient

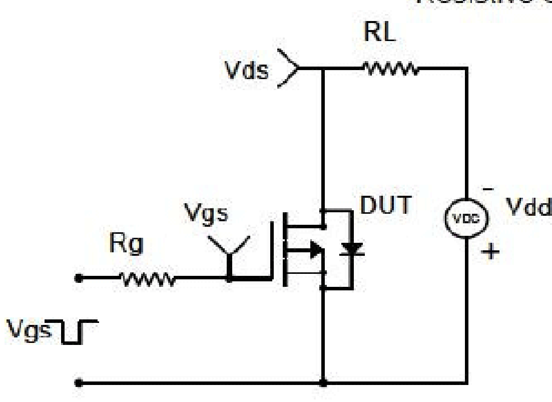
Typical Performance Characteristics (P-Channel)

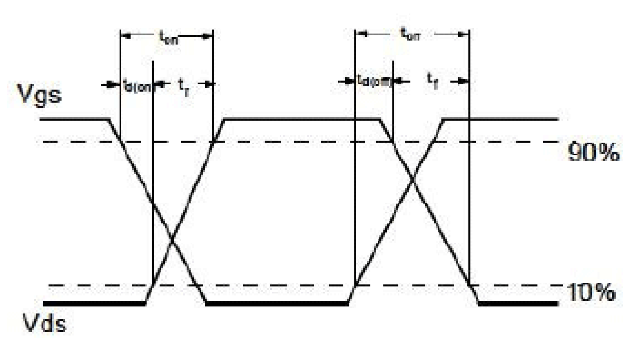
Gate Charge Test Circuit & Waveform



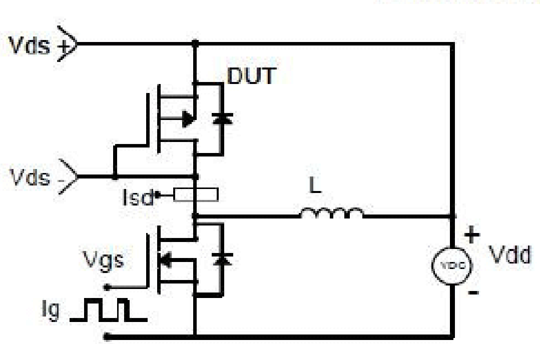


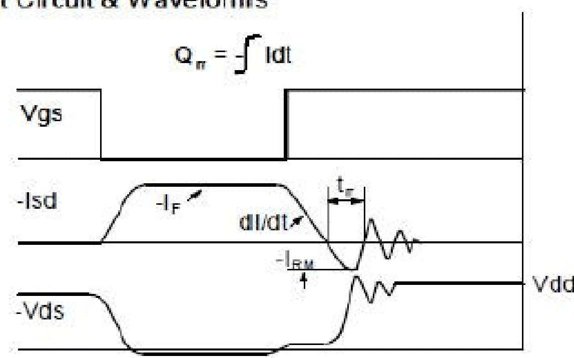
Resistive Switching Test Circuit & Waveforms





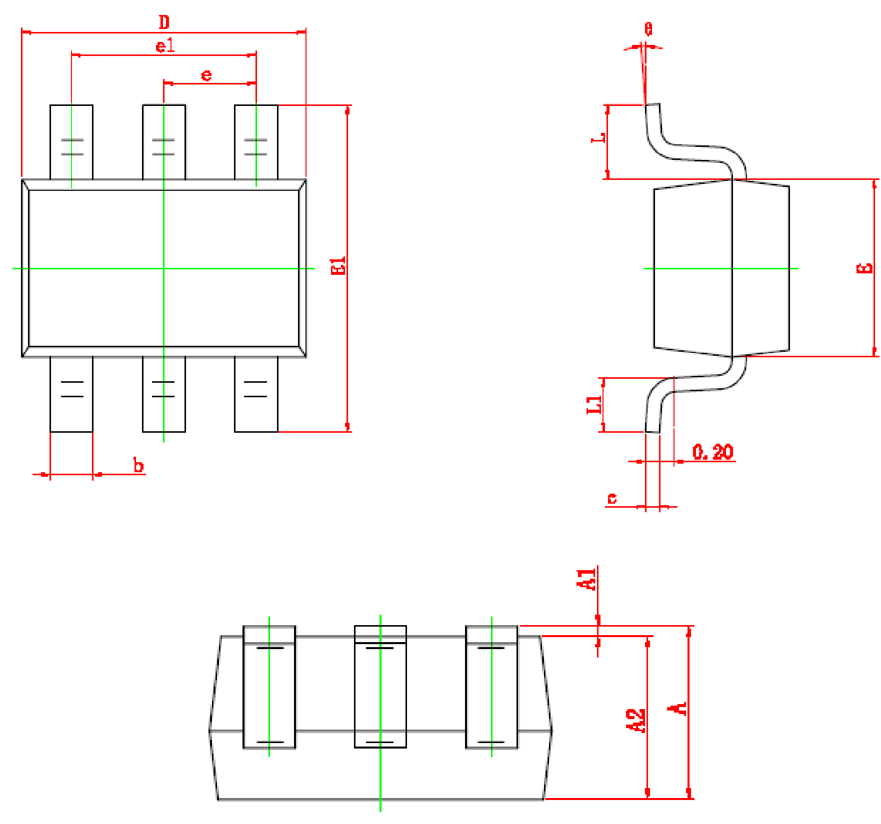
Diode Recovery Test Circuit & Waveforms





Package Dimension

SOT-363



Dimensions				
Symbol	**Millimeters**		**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	0º	8 º	0º	8 º

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