Elektronische Bauelemente

STT3599C

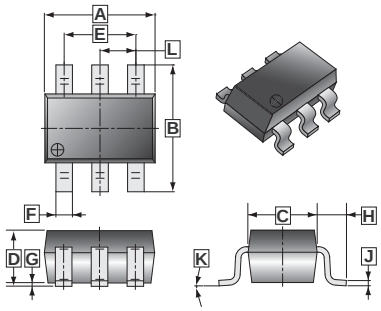
(N-Ch) 3.7 A, 30 V, $R_{DS(ON)}$ 63 mΩ
(P-Ch) -2.7 A, -30 V, $R_{DS(ON)}$ 112 mΩ
N & P-Channel Enhancement Mode Mos.FET

RoHS Compliant Product
A suffix of "-C" specifies halogen and lead-free

DESCRIPTION

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low $R_{DS(on)}$ and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

TSOP-6



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	0	0.10
B	2.60	3.00	H	0.60 REF.	
C	1.40	1.80	J	0.12 REF.	
D	1.10 MAX.		K	0°	10°
E	1.90 REF.		L	0.95 REF.	
F	0.30	0.50			

FEATURES

- Low $R_{DS(on)}$ provides higher efficiency and extends battery life.
- Low thermal impedance copper leadframe TSOP-6 saves board space.
- Fast switching speed.
- High performance trench technology.

PRODUCT SUMMARY

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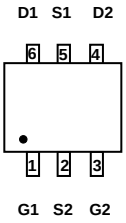
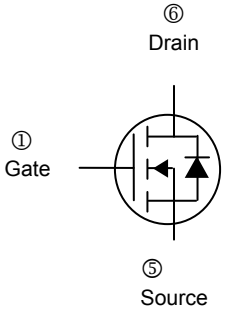
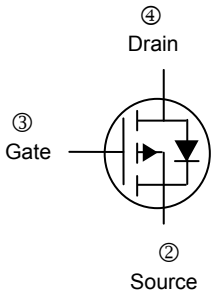
V_{DS}(V)	R_{DS}(on) (Ω)	I_D(A)
30	0.063@V_{GS}= 10V	3.7
	0.090@V_{GS}= 4.5V	3.1
-30	0.112@V_{GS}= -10V	-2.7
	0.172@V_{GS}= -4.5V	-2.2







ABSOLUTE MAXIMUM RATINGS(T_A=25℃ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Ratings		Unit
		N-Channel	P-Channel	
Drain-Source Voltage	V_{DS}	30	-30	V
Gate-Source Voltage	V_{GS}	±20	±20	V
Continuous Drain Current [a]	I_D @TA=25℃	3.7	-2.7	A
	I_D @TA=70℃	2.9	-2.1	
Pulsed Drain Current [b]	I_{DM}	8	-8	A
Continuous Source Current (Diode Conduction) [a]	I_S	1.05	-1.05	A
Power Dissipation [a]	P_D @TA=25℃	1.15		W
	P_D @TA=70℃	0.7		
Operating Junction and Storage Temperature Range	Tj, Tstg	-55 ~ +150		℃

THERMAL RESISTANCE RATINGS							
Parameter		Symbol	N-Channel		P-Channel		Unit
			Typ	Max	Typ	Max	
Maximum Junction to Ambient [a]	t ≦ 10 sec	$R_{\theta}JA$	93	110	93	110	℃ / W
	Steady State		130	150	130	150	

Notes

a. Surface Mounted on 1" x 1" FR4 Board.

b. Pulse width limited by maximum junction temperature.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Gate-Threshold Voltage	N-Ch	$V_{GS(th)}$	1	1.6	2.5	V	V_{DS}=V_{GS}, I_D=250uA
	P-Ch		-1	-1.6	-2.5		V_{DS}=V_{GS}, I_D= -250uA
Gate-Body Leakage Current	N-Ch	I_{GSS}	-	4.5nA	100	uA	V_{DS}= 0 V, V_{GS}= 20 V
	P-Ch		-	-4.5nA	-100		V_{DS}= 0 V, V_{GS}= -20 V
Zero Gate Voltage Drain Current	N-Ch	I_{DSS}	-	12nA	1	uA	V_{DS}=24 V, V_{GS}=0 V
	P-Ch		-	-12nA	-1		V_{DS}=-24V, V_{GS}=0 V
	N-Ch		-	-	10		V_{DS}=24V, V_{GS}=0 V, T_J=55℃
	P-Ch		-	-	-10		V_{DS}= -24V, V_{GS}=0 V, T_J=55℃
On-State Drain Current [a]	N-Ch	$I_{D(on)}$	5	-	-	A	V_{DS} = 5V, V_{GS}=10 V
	P-Ch		-5	-	-		V_{DS} = -5V, V_{GS}= -10 V
Drain-Source On-Resistance [a]	N-Ch	$R_{DS(ON)}$	-	0.057	0.063	Ω	V_{GS}=10V, I_D= 3.7A
	P-Ch		-	0.100	0.112		V_{GS}=-10V, I_D= -2.7A
	N-Ch		-	0.075	0.090		V_{GS}=4.5V, I_D= 3.1A
	P-Ch		-	0.148	0.172		V_{GS}=-4.5V, I_D= -2.2A
Forward Transconductance [a]	N-Ch	g_{fs}	-	10	-	S	V_{DS}= 5V, I_D= 3.7A
	P-Ch		-	5	-		V_{DS}= -5V, I_D= 3.1A
Diode Forward Voltage [a]	N-Ch	V_{SD}	-	0.80	-	S	I_S= 1.05A, V_{GS}= 0V
	P-Ch		-	-0.83	-		I_S= -1.05A, V_{GS}= 0V

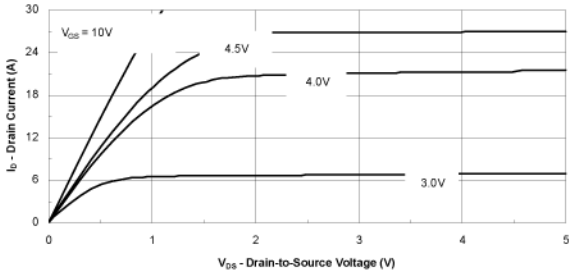
DYNAMIC [b]							
Total Gate Charge	N-Ch	Q_g	-	2.2	5	nC	N-Channel V_{DS}=15V, V_{GS}= 4.5V, I_D= 2.7A P-Channel V_{DS}= -15V, V_{GS}= -4.5V, I_D= -3.1A
	P-Ch		-	3.8	8		
Gate-Source Charge	N-Ch	Q_{gs}	-	0.5	1		
	P-Ch		-	0.6	2		
Gate-Drain Charge	N-Ch	Q_{gd}	-	0.8	2		
	P-Ch		-	1.5	3		
Input Capacitance	N-Ch	C_{iss}	-	184	400	pF	N-Channel V_{DS}= 15V, V_{GS}= 0V, f= 1MHz P-Channel V_{DS}= -15V, V_{GS}= 0V, f= 1MHz
	P-Ch		-	378	800		
Output Capacitance	N-Ch	C_{oss}	-	62	200		
	P-Ch		-	126	300		
Reverse Transfer Capacitance	N-Ch	C_{rss}	-	30	200		
	P-Ch		-	52	300		
Turn-on Delay Time	N-Ch	$T_{d(on)}$	-	5	10	nS	N-Channel V_{DD}= 15V, R_{GEN}= 15 Ω, V_{GS}= 4.5V, I_D= 1A P-Channel V_{DD}= -15V, R_{GEN}= 15 Ω V_{GS}= -4.5V, I_D= -1A
	P-Ch		-	5	10		
Rise Time	N-Ch	T_r	-	12	30		
	P-Ch		-	15	30		
Turn-off Delay Time	N-Ch	$T_{d(off)}$	-	13	30		
	P-Ch		-	20	40		
Fall Time	N-Ch	T_f	-	7	20		
	P-Ch		-	20	40		

Notes

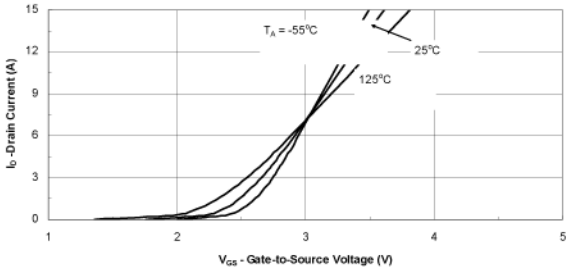
a. Pulse test：PW ≦ 300 us duty cycle ≦ 2%.

b. Guaranteed by design, not subject to production testing.

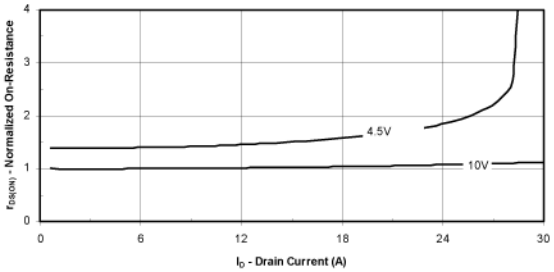
CHARACTERISTIC CURVES (N-Channel)



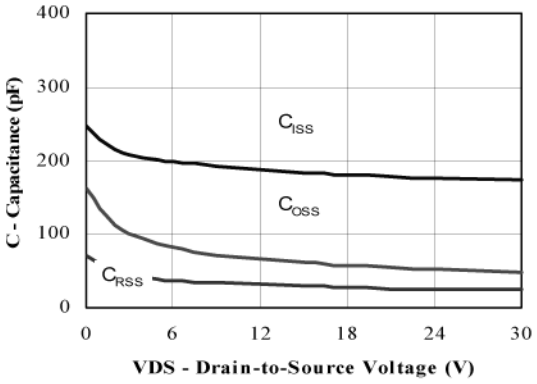
Output Characteristics



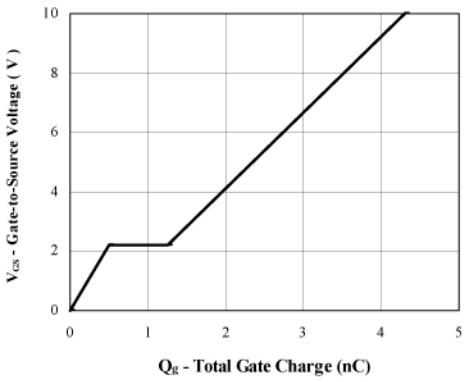
Transfer Characteristics



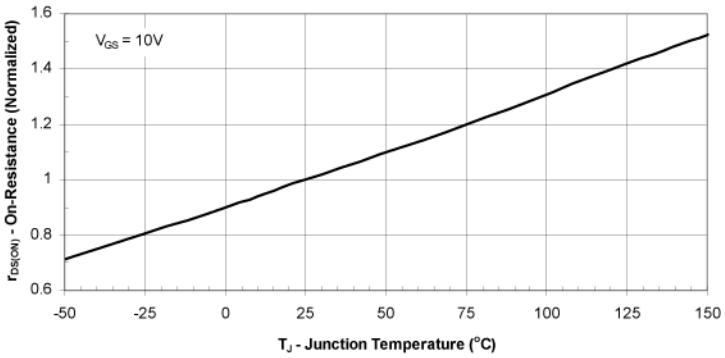
On-Resistance vs. Drain Current



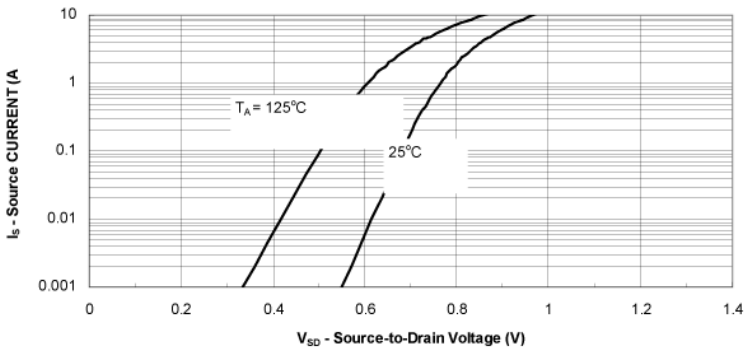
Capacitance



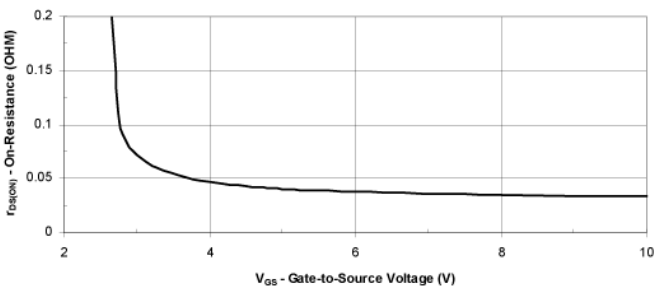
Gate Charge



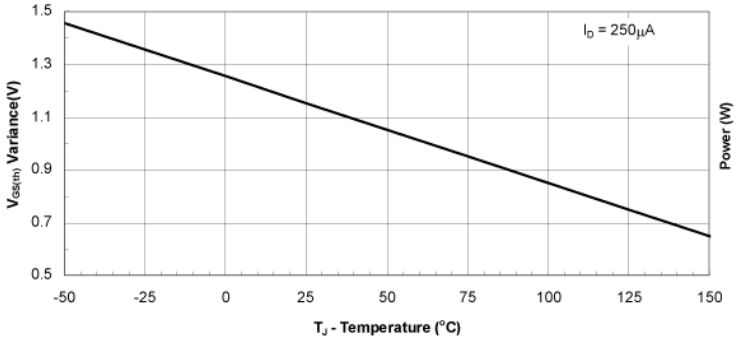
On-Resistance vs. Junction Temperature

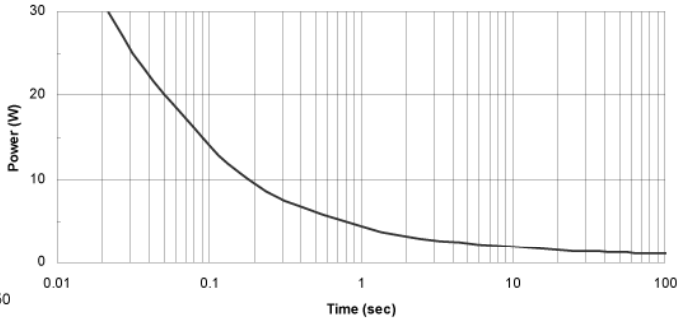


Source-Drain Diode Forward Voltage



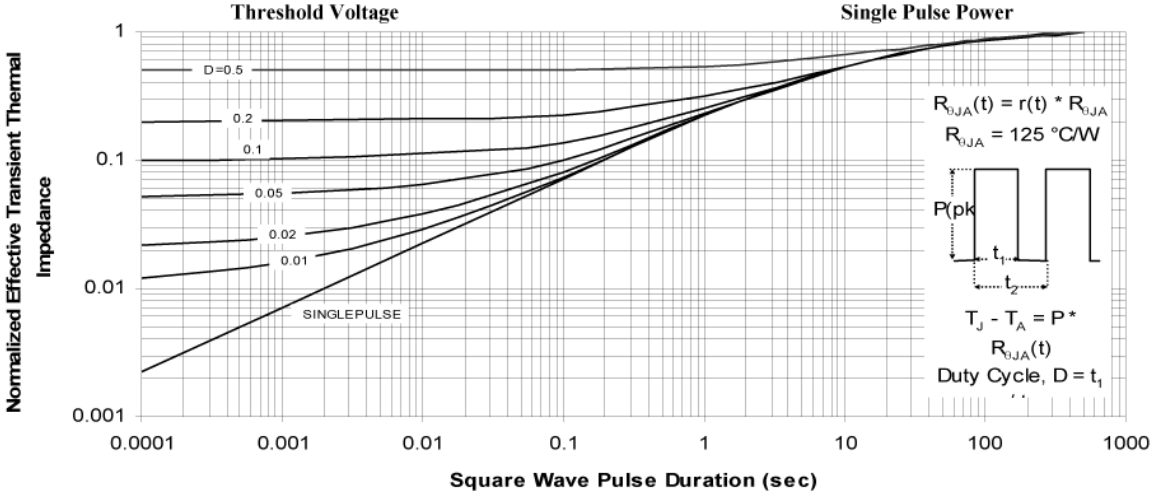
On-Resistance vs.Gate-to Source Voltage





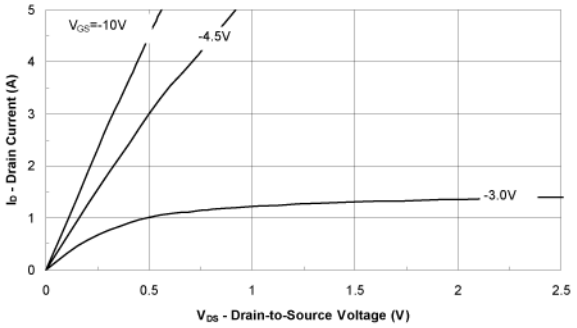
Threshold Voltage

Single Pulse Power

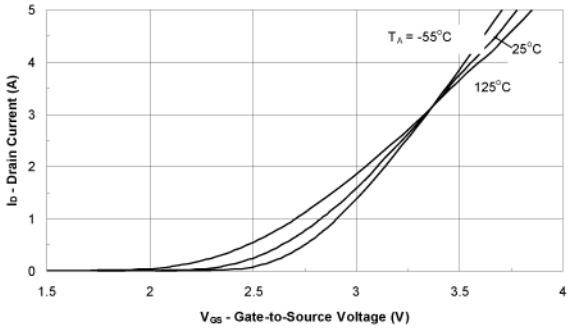


Normalized Thermal Transient Impedance, Junction-to-Ambient

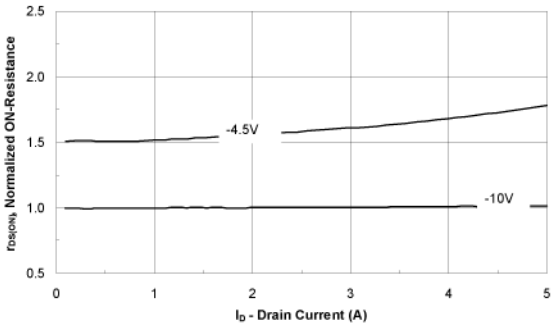
CHARACTERISTIC CURVES (P-Channel)



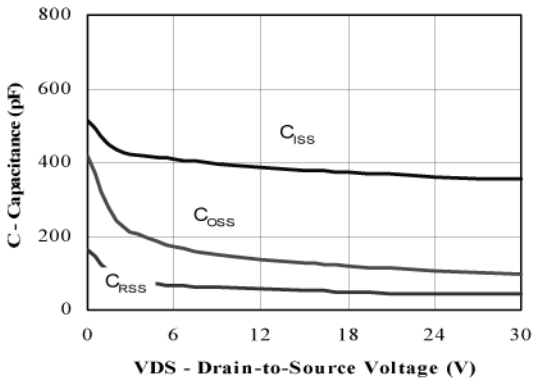
Output Characteristics



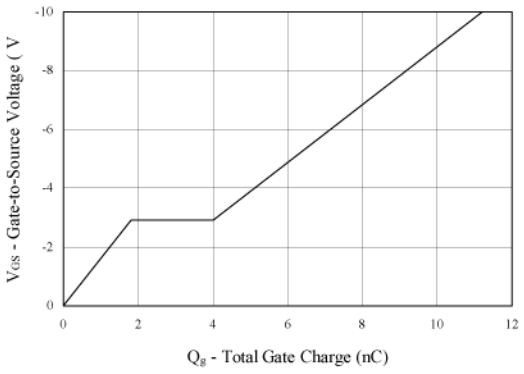
Transfer Characteristics



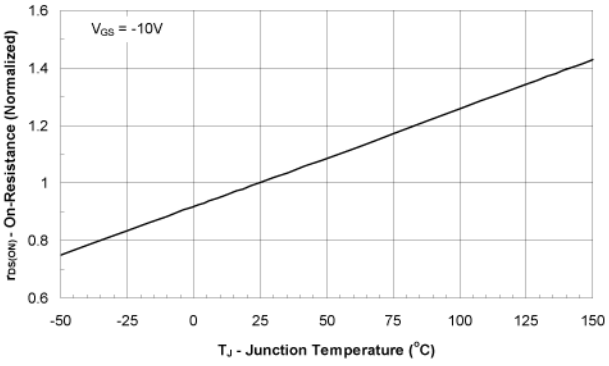
On-Resistance vs. Drain Current



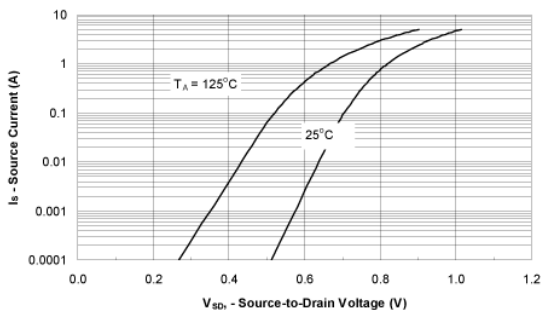
Capacitance



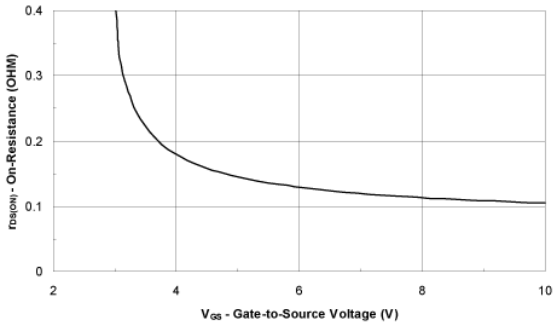
Gate Charge



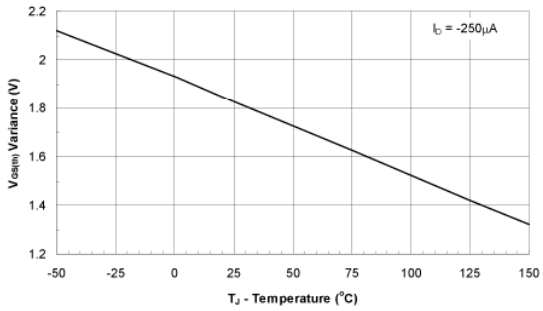
On-Resistance vs. Junction Temperature

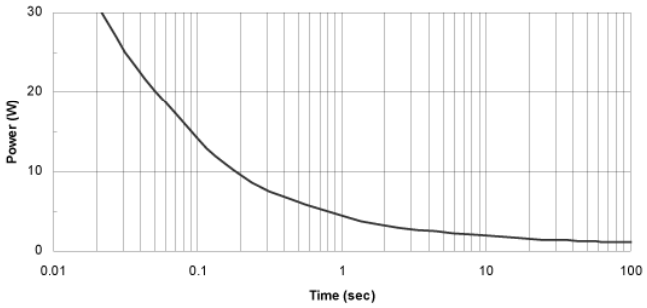


Source-Drain Diode Forward Voltage

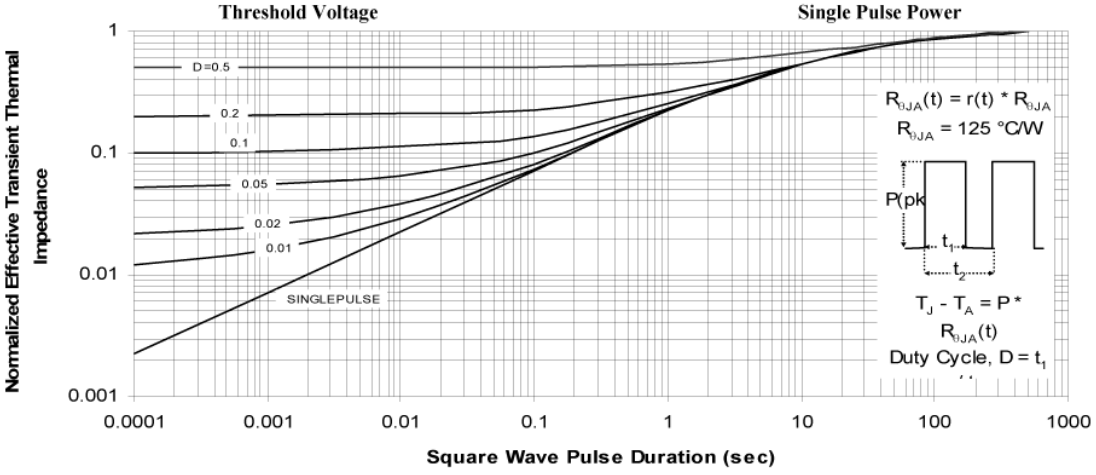


On-Resistance vs.Gate-to Source Voltage





Threshold Voltage **Single Pulse Power**



Normalized Thermal Transient Impedance, Junction-to-Ambient