Elektronische Bauelemente

SSG4512CE

N & P-Ch Enhancement Mode Power MOSFET

N-Ch: 6.9 A, 30 V, $R_{DS(ON)}$ 31 mΩ

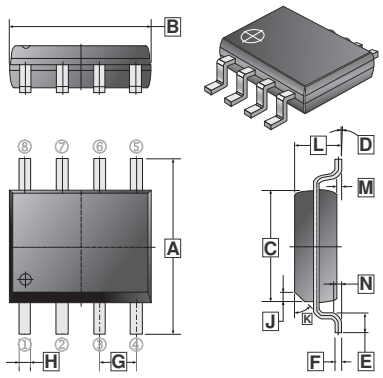
P-Ch: -5.2 A, -30 V, $R_{DS(ON)}$ 52 mΩ

RoHS Compliant Product
A suffix of "-C" specifies halogen & 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.

SOP-8



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.80	6.20	H	0.35	0.49
B	4.80	5.00	J	0.375 REF.	
C	3.80	4.00	K	45°	
D	0°	8°	L	1.35	1.75
E	0.40	0.90	M	0.10	0.25
F	0.19	0.25	N	0.25 REF.	
G	1.27 TYP.				

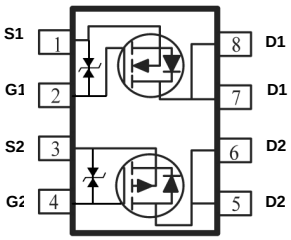
FEATURES

- Low $R_{DS(on)}$ provides higher efficiency and extends battery life.
- Low thermal impedance copper leadframe SOP-8 saves board space.
- Fast Switch Speed.
- High performance trench technology.

APPLICATION

DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

ESD
Protection Diode
2KV



PACKAGE INFORMATION

Package	MPQ	Leader Size
SOP-8	2.5K	13 inch

MAXIMUM RATINGS (T_A=25°C unless otherwise specified)

Parameter		Symbol	Ratings		Unit
			N-Ch	P-Ch	
Drain-Source Voltage		V_{DS}	30	-30	V
Gate-Source Voltage		V_{GS}	±20	±20	V
Continuous Drain Current[1]	T_A=25°C	I_D	6.9	-5.2	A
	T_A=70°C		5.4	-6.8	A
Pulsed Drain Current[2]		I_{DM}	20	-20	A
Continuous Source Current (Diode Conduction) [1]		I_S	1.3	-1.3	A
Total Power Dissipation[1]	T_A=25°C	P_D	2.1	2.1	W
	T_A=70°C		1.3	1.3	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~150		°C
Thermal Resistance Ratings					
Maximum Junction-ambient [1]	t<=5 sec	$R_{\theta JA}$	60		°C / W
Maximum Junction-Case [1]	t<=5 sec	$R_{\theta JC}$	40		°C / W

Notes：

1. Surface Mounted on 1" x 1" FR4 Board.
2. Pulse width limited by maximum junction temperature

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static						
Gate Threshold Voltage	$V_{GS(th)}$	1	-	-	V	V_{DS}=V_{GS}, I_D=250μA
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS}= 8V, V_{DS}=0
Drain-Source Leakage Current	I_{DSS}	-	-	1	μA	V_{DS}=24V, V_{GS}=0
On-State Drain Current[1]	$I_{D(ON)}$	20	-	-	A	V_{DS}=5V, V_{GS}=10V
Static Drain-Source On-Resistance[1]	$R_{DS(ON)}$	-	-	31	mΩ	V_{GS}=10V, I_D=6.9A
		-	-	40		V_{GS}=4.5V, I_D=6A
Forward Transconductance[1]	g_{fs}	-	25	-	S	V_{DS}=15V, I_D=6.9A
Dynamic						
Total Gate Charge	Q_g	-	4.0		nC	I_D=6.9A V_{DS}=15V V_{GS}=10V
Gate-Source Charge	Q_{gs}	-	1.1	-		
Gate-Drain (“Miller”) Change	Q_{gd}	-	1.4	-		
Turn-on Delay Time	$T_{d(on)}$	-	8	-	nS	V_{DD}=15V V_{GS}=10V I_D=1A R_{GEN}=6Ω
Rise Time	T_r	-	5	-		
Turn-off Delay Time	$T_{d(off)}$	-	23	-		
Fall Time	T_f	-	3	-		

Notes:
1. Pulse test: PW ≦ 300us duty cycle ≦ 2%.
2. Guaranteed by design, not subject to production testing.

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static						
Gate Threshold Voltage	$V_{GS(th)}$	-1	-	-	V	V_{DS}=V_{GS}, I_D= -250μA
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS}= -8V, V_{DS}=0
Drain-Source Leakage Current	I_{DSS}	-	-	-1	μA	V_{DS}= -24V, V_{GS}=0
On-State Drain Current[1]	$I_{D(ON)}$	-20	-	-	A	V_{DS}= -5V, V_{GS}= -10V
Static Drain-Source On-Resistance[1]	$R_{DS(ON)}$	-	-	52	mΩ	V_{GS}= -10V, I_D= -5.2A
		-	-	80		V_{GS}= -4.5V, I_D= -4.2A
Forward Transconductance[1]	g_{fs}	-	10	-	S	V_{DS}= -15V, I_D= -5.2A
Dynamic						
Total Gate Charge	Q_g	-	10		nC	I_D= -5.2A V_{DS}= -15V V_{GS}= -10V
Gate-Source Charge	Q_{gs}	-	2.2	-		
Gate-Drain (“Miller”) Change	Q_{gd}	-	1.7	-		
Turn-on Delay Time	$T_{d(on)}$	-	10	-	nS	V_{DD}= -15V V_{GS}= -10V I_D= -1A R_{GEN}=6Ω
Rise Time	T_r	-	2.8	-		
Turn-off Delay Time	$T_{d(off)}$	-	53.6	-		
Fall Time	T_f	-	46	-		

Notes:
1. Pulse test: PW ≦ 300us duty cycle ≦ 2%.
2. Guaranteed by design, not subject to production testing.

CHARACTERISTIC CURVE (N-Ch)

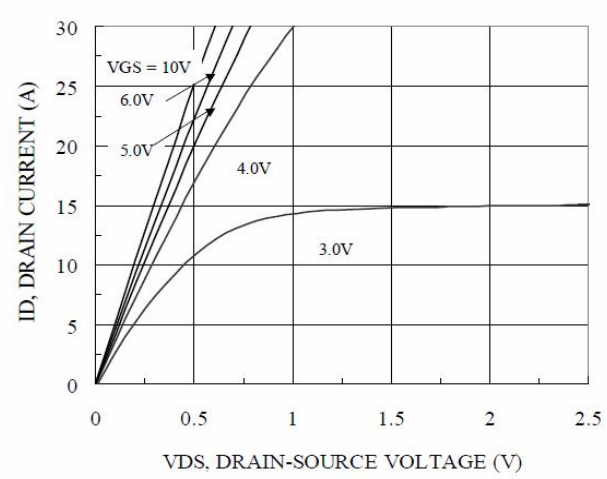


Figure 1. On-Region Characteristics

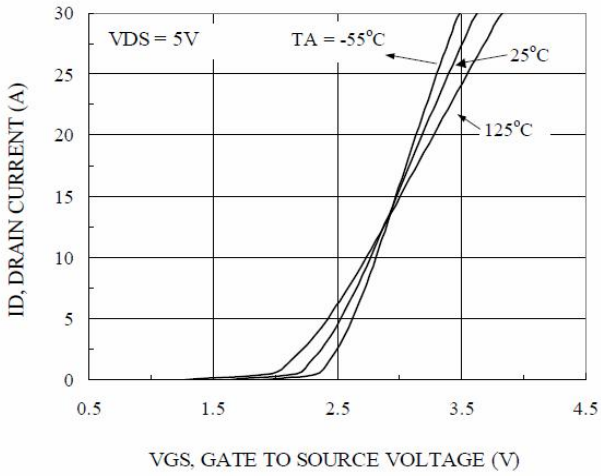


Figure 2. Body Diode Forward Voltage Variation with Source Current and Temperature

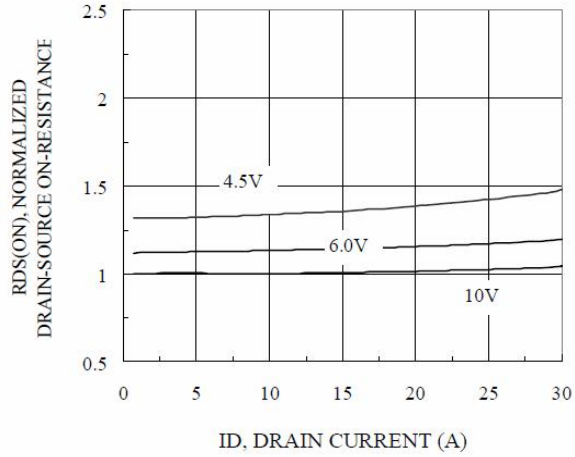


Figure 3. On Resistance Vs Vgs Voltage

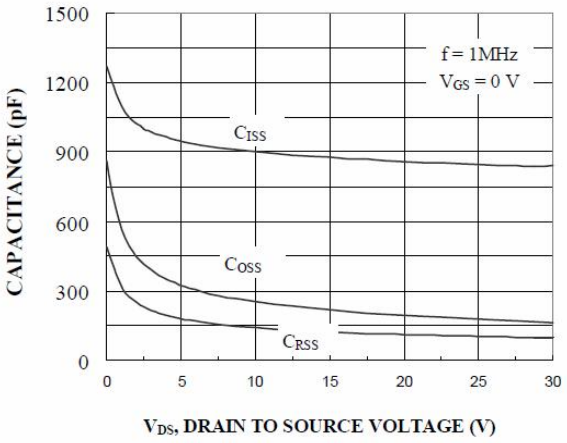


Figure 4. Capacitance Characteristics

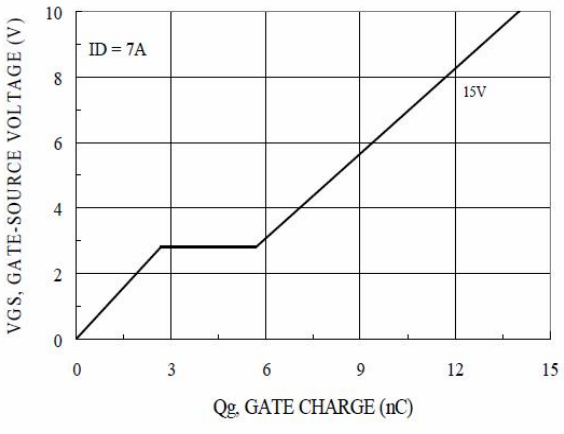


Figure 5. Gate Charge Characteristics

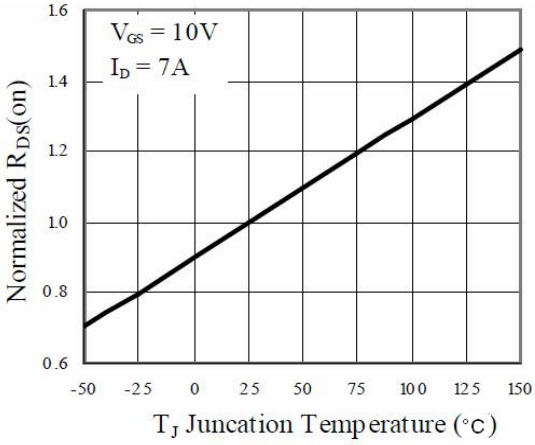


Figure 6. On-Resistance Variation with Temperature

CHARACTERISTIC CURVE (N-Ch)

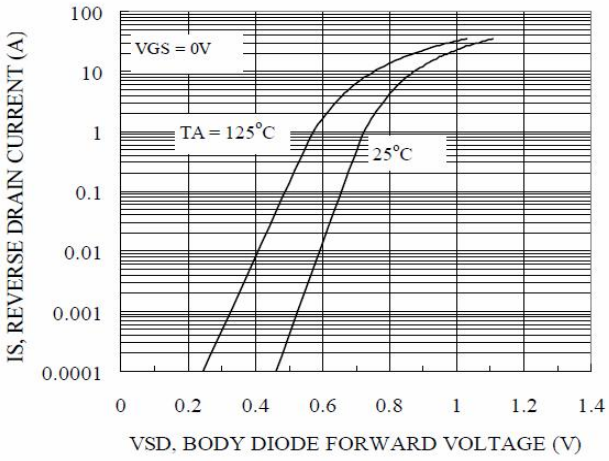


Figure 7. Transfer Characteristics

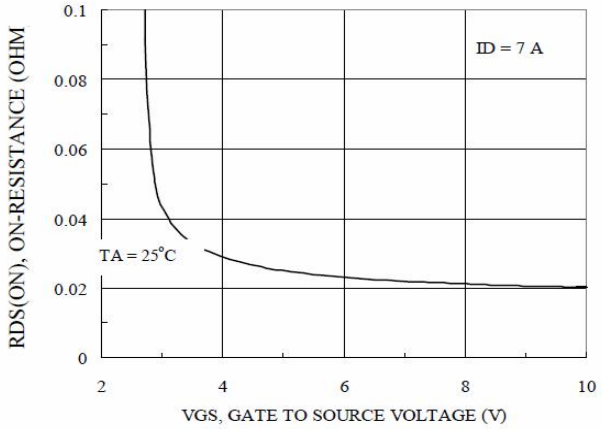


Figure 8. On-Resistance with Gate to Source Voltage

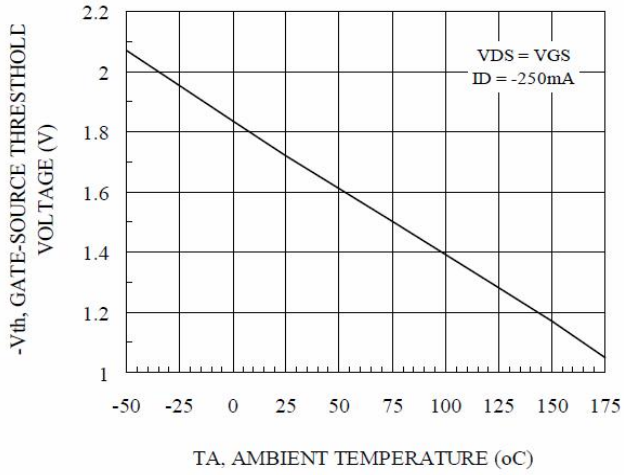


Figure 9. Vth Gate to Source Voltage Vs Temperature

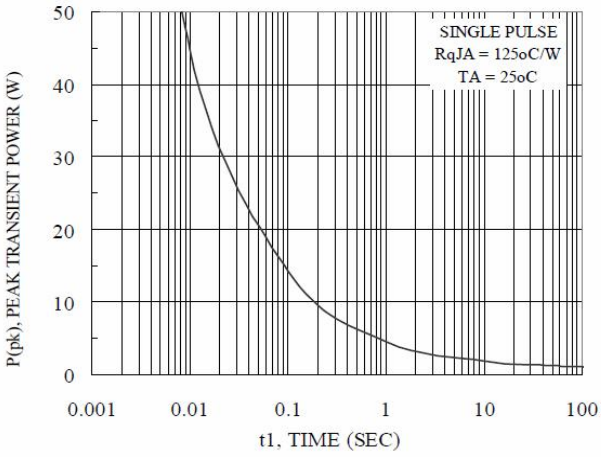


Figure 10. Single Pulse Maximum Power Dissipation

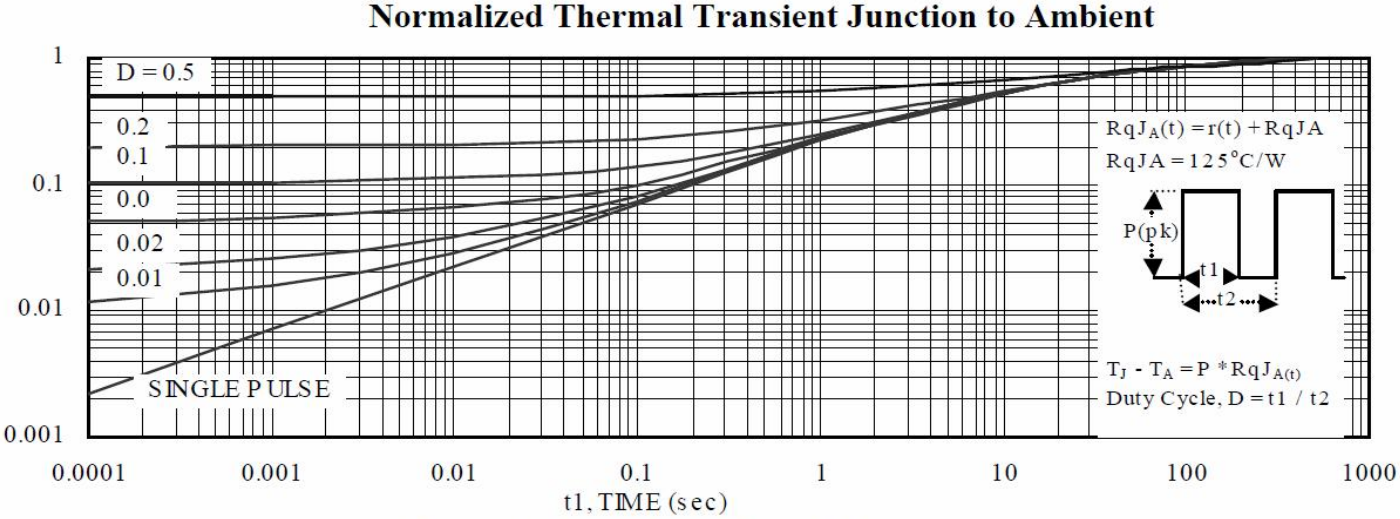
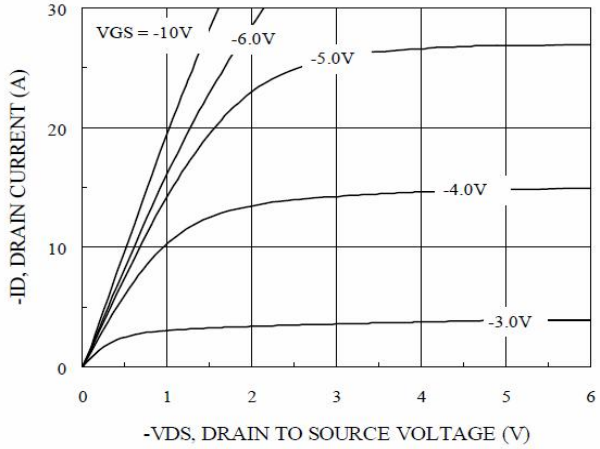


Figure 11. Transient Thermal Response Curve

CHARACTERISTIC CURVE (P-Ch)



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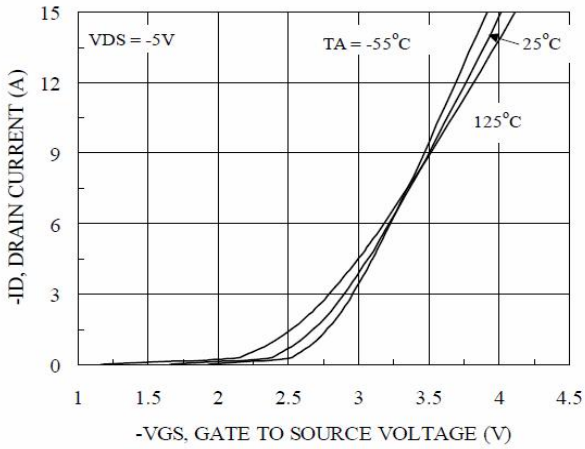

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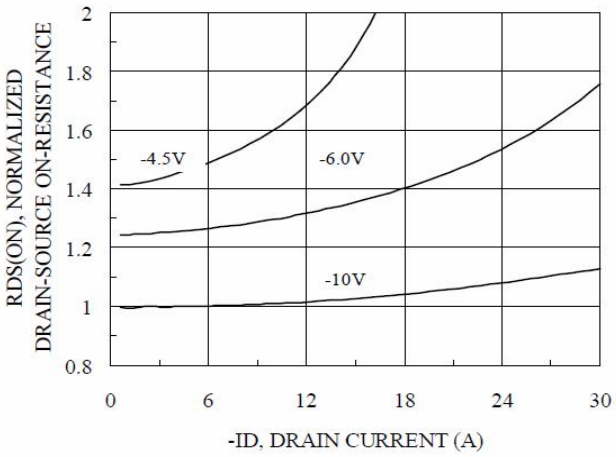

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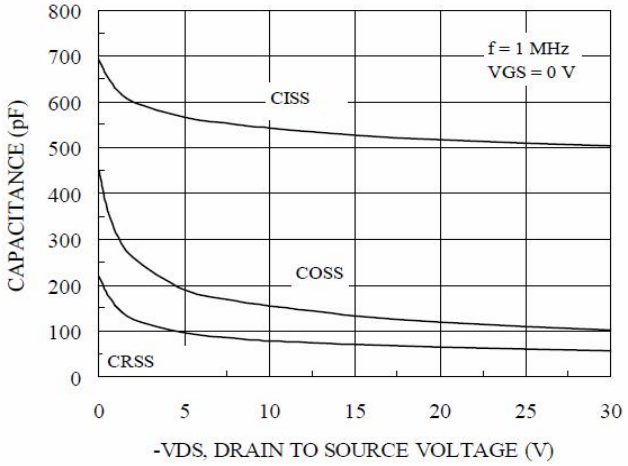

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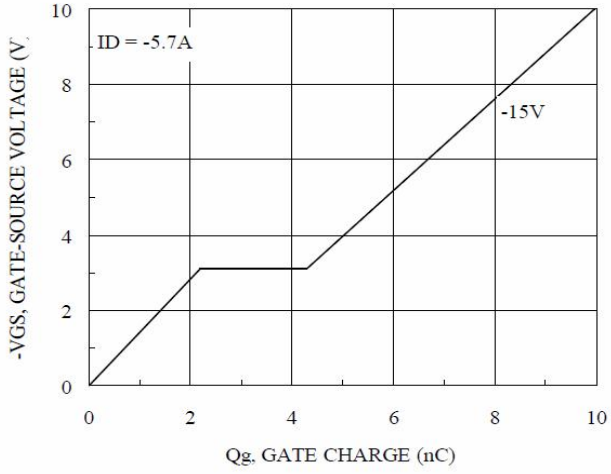

Figure 5. Gate Charge Characteristics

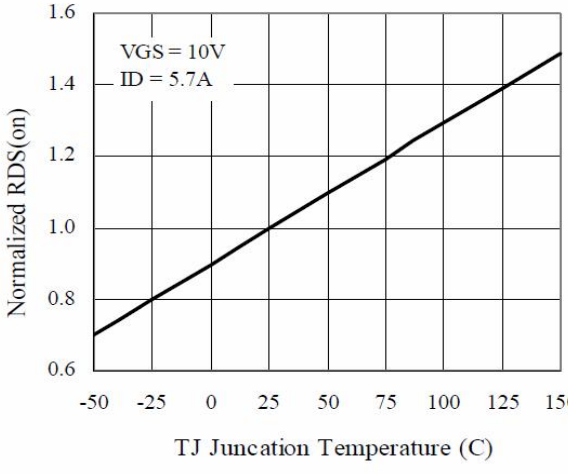

Figure 6. On-Resistance Variation with Temperature

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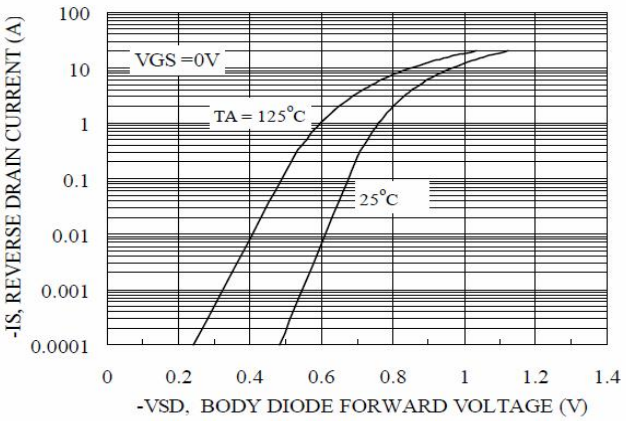


Figure 7. Transfer Characteristics

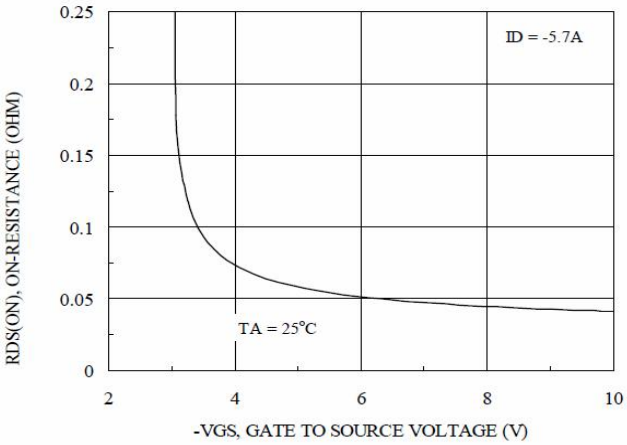


Figure 8. On-Resistance with Gate to Source Voltage

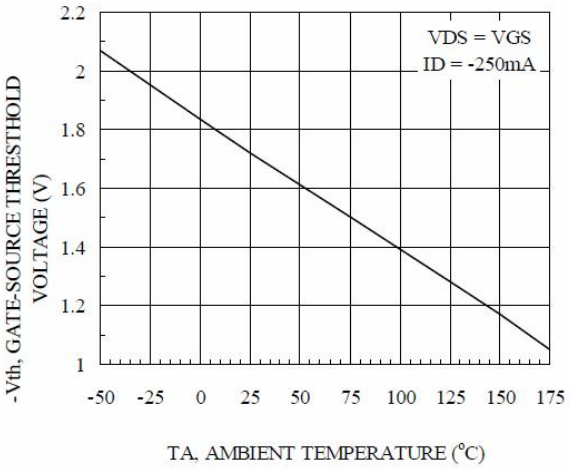


Figure 9. Vth Gate to Source Voltage Vs Temperature

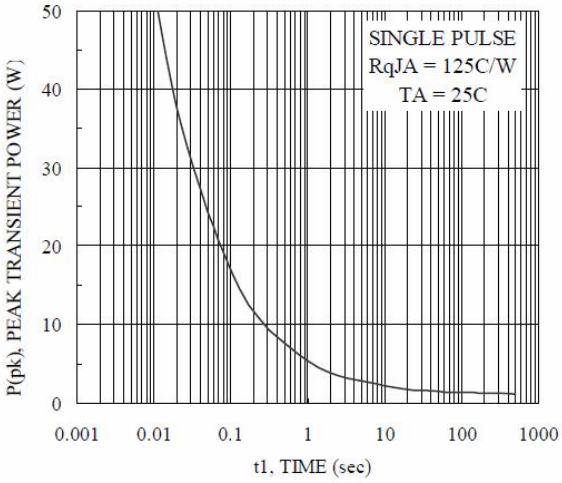
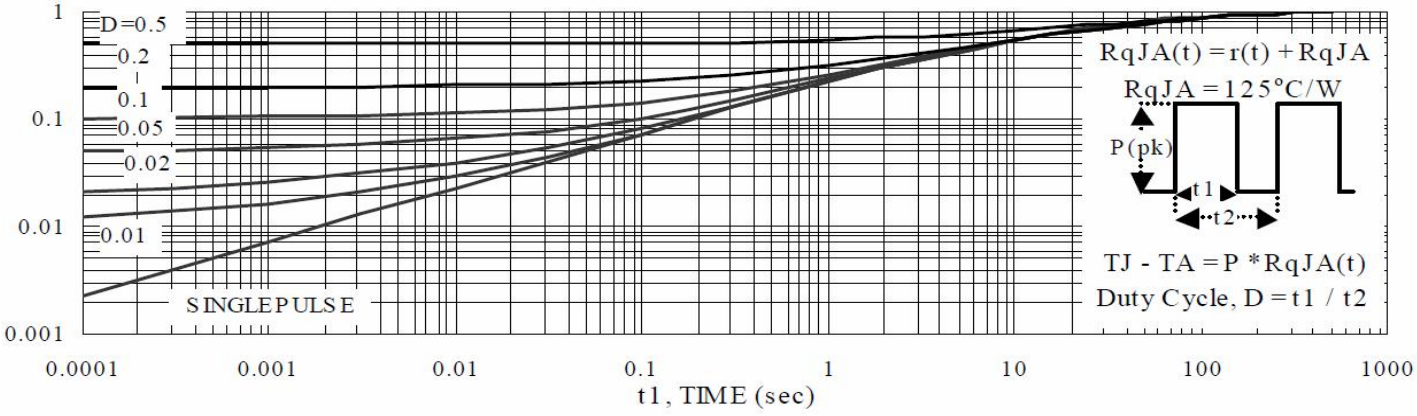


Figure 10. Single Pulse Maximum Power Dissipation

Normalized Thermal Transient Junction to Ambient



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