

SSG4542C

N-Ch: 8.3 A, 40 V, $R_{DS(ON)}$ 14 m Ω
P-Ch: -7.6 A, -40 V, $R_{DS(ON)}$ 28 m Ω
N & P-Ch Enhancement Mode Power MOSFET

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

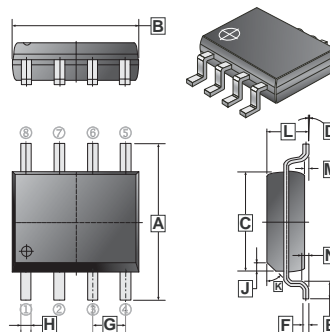
DESCRIPTION

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. 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.

FEATURES

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

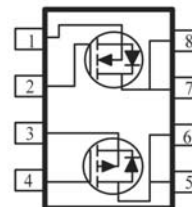
SOP-8



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.8	6.20	H	0.35	0.51
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	0.50	0.93	M	0.10	0.25
F	0.19	0.25	N	0.25 REF.	
G	1.27 TYP.				

PACKAGE INFORMATION

Package	MPQ	LeaderSize
SOP-8	2.5K	13' inch



MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

PARAMETER	SYMBOL	N-CH	P-CH	Unit
Drain-Source Voltage	V_{DS}	40	-40	V
Gate-Source Voltage	V_{GS}	20	-20	V
Continuous Drain Current ¹	$I_D @ T_A = 25^\circ\text{C}$	8.3	-7.6	A
	$I_D @ T_A = 70^\circ\text{C}$	6.8	-6.3	A
Pulsed Drain Current ²	I_{DM}	± 50	± 50	A
Continuous Source Current (Diode Conduction) ¹	I_S	2.3	-2.1	A
Total Power Dissipation ¹	$P_D @ T_A = 25^\circ\text{C}$	2.1	2.1	W
	$P_D @ T_A = 70^\circ\text{C}$	1.3	1.3	W
Operating Junction & Storage Temperature Range	T_J, T_{STG}	-55 ~ 150		$^\circ\text{C}$
Thermal Resistance Ratings				
Maximum Junction-to-Ambient ¹	$t \leq 10$ sec	$R_{\theta JA}$	62.5	$^\circ\text{C} / \text{W}$
	Steady State		110	$^\circ\text{C} / \text{W}$

Notes:

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

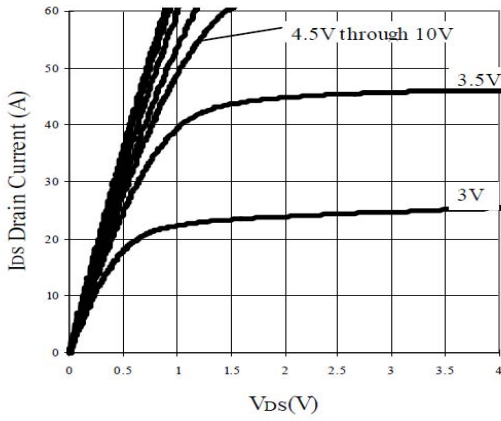
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Ch	Min.	Typ.	Max.	Unit	Test Conditions
Static							
Gate Threshold Voltage	$V_{GS(th)}$	N	1	1.5	3	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
		P	-1	-1.4	-3		$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Gate-Body Leakage Current	I_{GSS}	N	-	6	± 100	nA	$V_{DS} = 0\text{V}, V_{GS} = 20\text{V}$
		P	-	7	± 100		$V_{DS} = 0\text{V}, V_{GS} = -20\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	N	-	2nA	1	μA	$V_{DS} = 32\text{V}, V_{GS} = 0\text{V}$
		P	-	12nA	-1		$V_{DS} = -32\text{V}, V_{GS} = 0\text{V}$
On-State Drain Current ¹	$I_{D(on)}$	N	25	-	-	A	$V_{DS} = 5\text{V}, V_{GS} = 10\text{V}$
		P	-50	-	-		$V_{DS} = -5\text{V}, V_{GS} = -10\text{V}$
Drain-Source On-Resistance ¹	$R_{DS(ON)}$	N	-	14	22	m Ω	$V_{GS} = 10\text{V}, I_D = 8.3\text{A}$
			-	17	27		$V_{GS} = 4.5\text{V}, I_D = 7.3\text{A}$
		P	-	28	30		$V_{GS} = -10\text{V}, I_D = -7.6\text{A}$
			-	35	40		$V_{GS} = -4.5\text{V}, I_D = -6.2\text{A}$
Forward Transconductance ¹	g_{fs}	N	-	40	-	S	$V_{DS} = 15\text{V}, I_D = 8.3\text{A}$
		P	-	31	-		$V_{DS} = -15\text{V}, I_D = -7.6\text{A}$
Dynamic ²							
Total Gate Charge	Q_g	N	-	13	30	nC	N-Channel $I_D = 8.3\text{A}, V_{DS} = 15\text{V}, V_{GS} = 4.5\text{V}$ P-Channel $I_D = -7.6\text{A}, V_{DS} = -15\text{V}, V_{GS} = -4.5\text{V}$
		P	-	14	30		
Gate-Source Charge	Q_{gs}	N	-	3.3	7	nC	N-Channel $I_D = 8.3\text{A}, V_{DS} = 15\text{V}, V_{GS} = 4.5\text{V}$ P-Channel $I_D = -7.6\text{A}, V_{DS} = -15\text{V}, V_{GS} = -4.5\text{V}$
		P	-	5.8	12		
Gate-Drain Charge	Q_{gd}	N	-	4.5	10	nC	N-Channel $I_D = 8.3\text{A}, V_{DS} = 15\text{V}, V_{GS} = 4.5\text{V}$ P-Channel $I_D = -7.6\text{A}, V_{DS} = -15\text{V}, V_{GS} = -4.5\text{V}$
		P	-	12	30		
Input Capacitance	C_{iss}	N	-	1317	3000	pF	N-Channel $f = 1\text{MHz}, V_{DS} = 15\text{V}, V_{GS} = 0\text{V}$ P-Channel $f = 1\text{MHz}, V_{DS} = -15\text{V}, V_{GS} = 0\text{V}$
		P	-	1583	4000		
Output Capacitance	C_{oss}	N	-	272	600	pF	N-Channel $f = 1\text{MHz}, V_{DS} = 15\text{V}, V_{GS} = 0\text{V}$ P-Channel $f = 1\text{MHz}, V_{DS} = -15\text{V}, V_{GS} = 0\text{V}$
		P	-	278	600		
Reverse Transfer Capacitance	C_{rss}	N	-	169	400	pF	N-Channel $f = 1\text{MHz}, V_{DS} = 15\text{V}, V_{GS} = 0\text{V}$ P-Channel $f = 1\text{MHz}, V_{DS} = -15\text{V}, V_{GS} = 0\text{V}$
		P	-	183	400		
Turn-On Delay Time	$T_{d(on)}$	N	-	20	40	nS	N-Channel $V_{DD} = 15\text{V}, V_{GS} = 10\text{V}$ $I_D = 1\text{A}, R_{GEN} = 25\Omega$ P-Channel $V_{DD} = -15\text{V}, V_{GS} = -10\text{V}$ $I_D = -1\text{A}, R_{GEN} = 15\Omega$
		P	-	15	30		
Rise Time	T_r	N	-	9	20	nS	N-Channel $V_{DD} = 15\text{V}, V_{GS} = 10\text{V}$ $I_D = 1\text{A}, R_{GEN} = 25\Omega$ P-Channel $V_{DD} = -15\text{V}, V_{GS} = -10\text{V}$ $I_D = -1\text{A}, R_{GEN} = 15\Omega$
		P	-	16	40		
Turn-Off Delay Time	$T_{d(off)}$	N	-	70	200	nS	N-Channel $V_{DD} = 15\text{V}, V_{GS} = 10\text{V}$ $I_D = 1\text{A}, R_{GEN} = 25\Omega$ P-Channel $V_{DD} = -15\text{V}, V_{GS} = -10\text{V}$ $I_D = -1\text{A}, R_{GEN} = 15\Omega$
		P	-	62	200		
Fall Time	T_f	N	-	20	40	nS	N-Channel $V_{DD} = 15\text{V}, V_{GS} = 10\text{V}$ $I_D = 1\text{A}, R_{GEN} = 25\Omega$ P-Channel $V_{DD} = -15\text{V}, V_{GS} = -10\text{V}$ $I_D = -1\text{A}, R_{GEN} = 15\Omega$
		P	-	46	100		

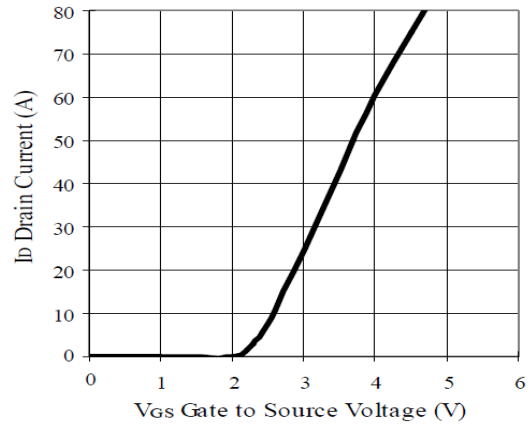
Notes:

- Pulse test : $PW \leq 300\mu\text{s}$ duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.

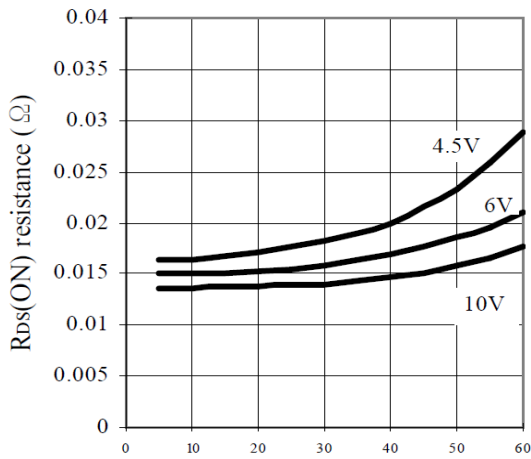
CHARACTERISTIC CURVES (N-Channel)



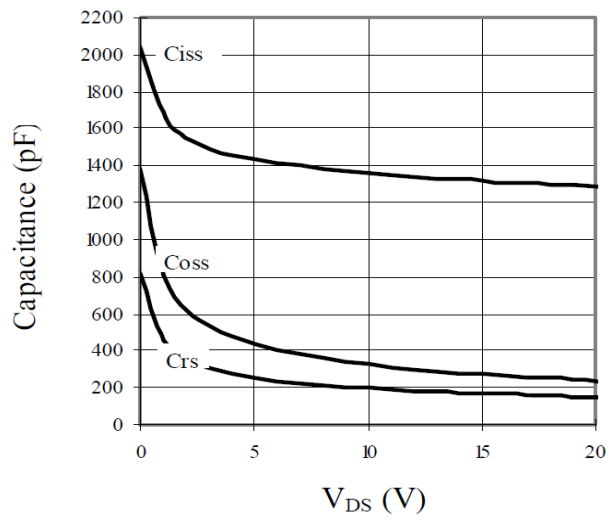
Output Characteristics



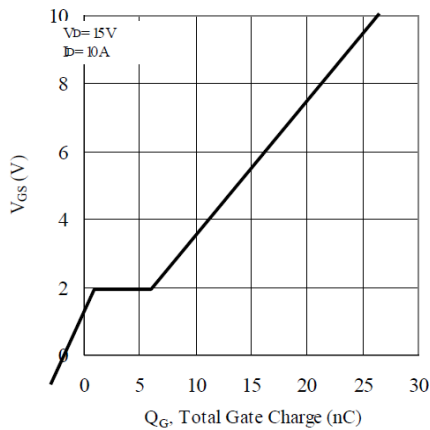
Transfer Characteristics



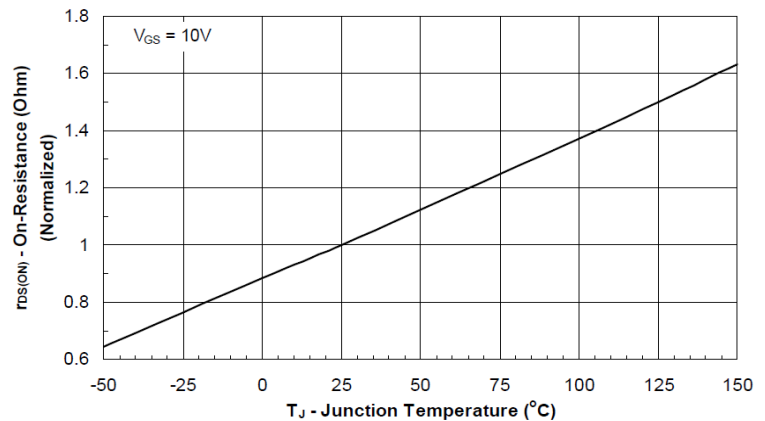
On Resistance vs. Drain Current



Capacitance

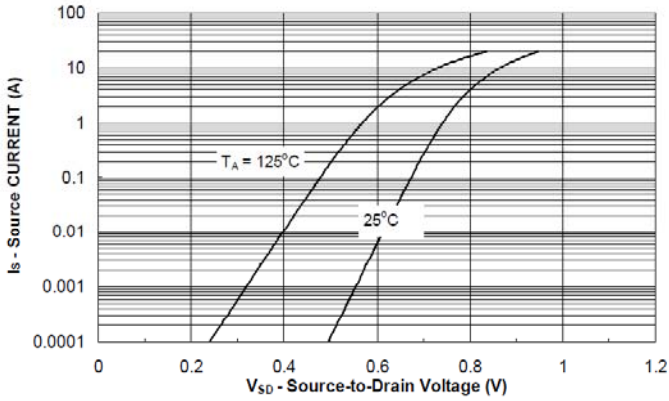


Gate Charge

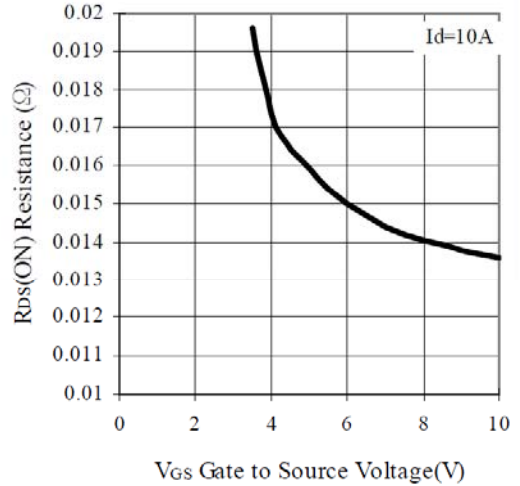


On-Resistance vs. Junction Temperature

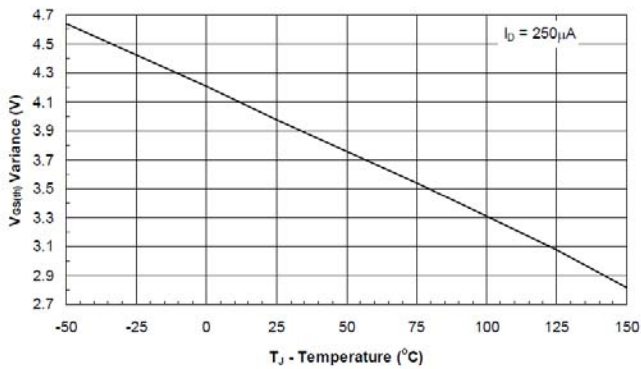
CHARACTERISTIC CURVES



Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

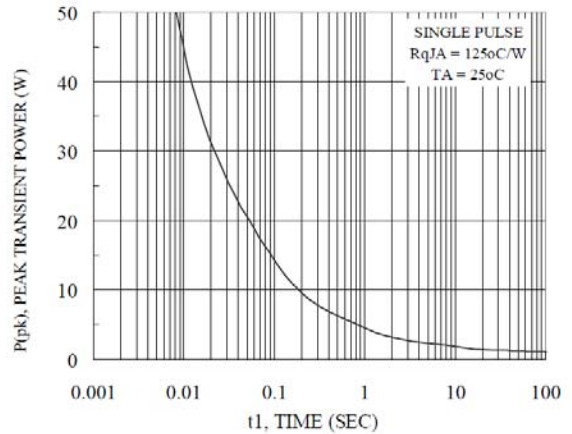


Figure 10. Single Pulse Maximum Power Dissipation

Normalized Thermal Transient Junction to Ambient

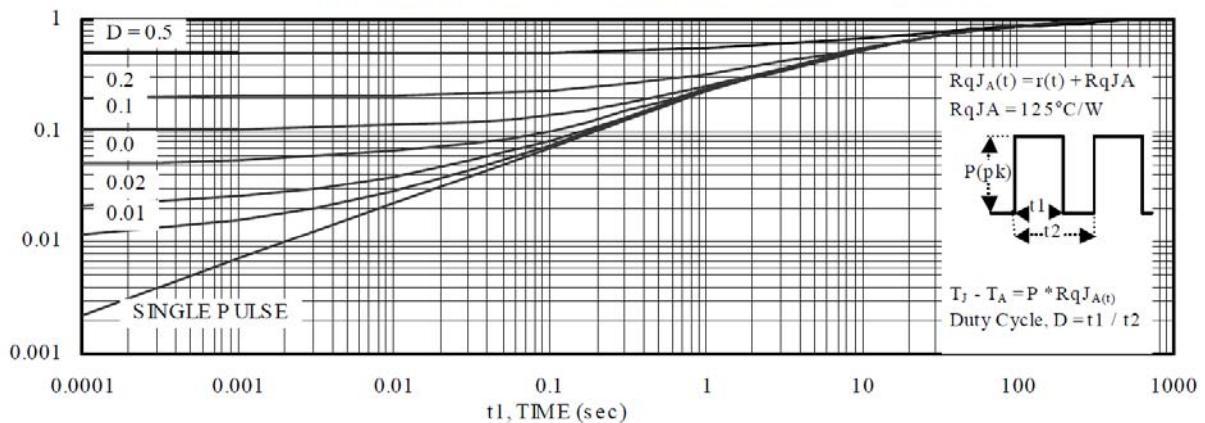
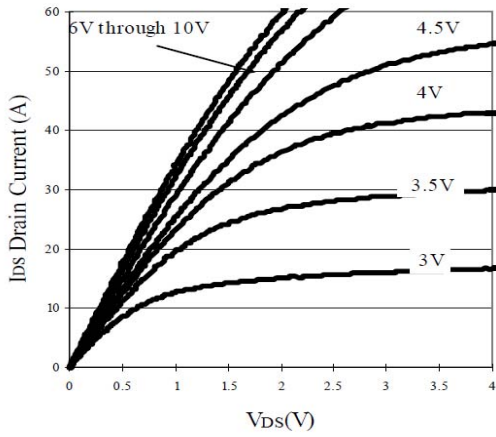
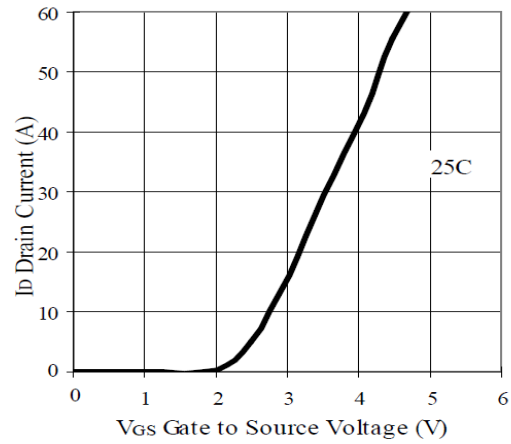


Figure 11. Transient Thermal Response Curve

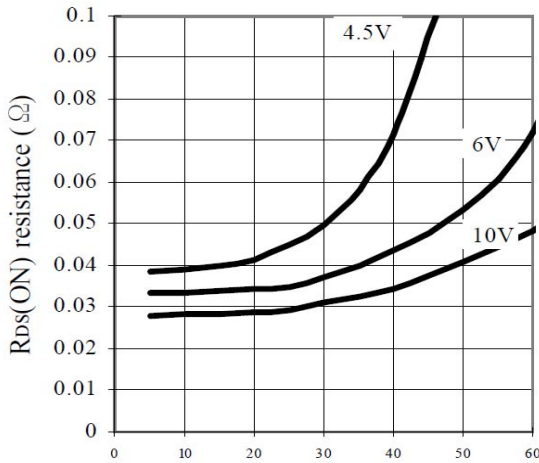
CHARACTERISTIC CURVES (P-Channel)



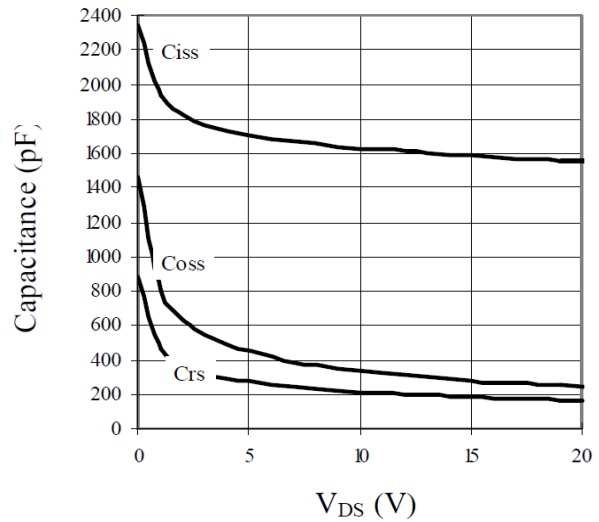
Output Characteristics



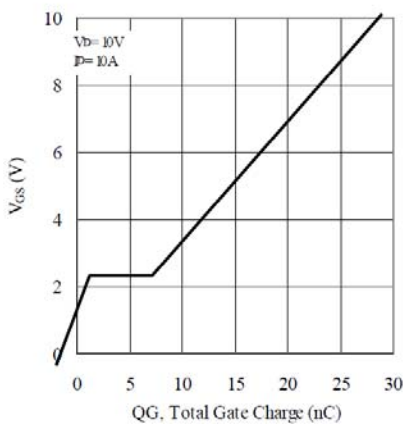
Transfer Characteristics



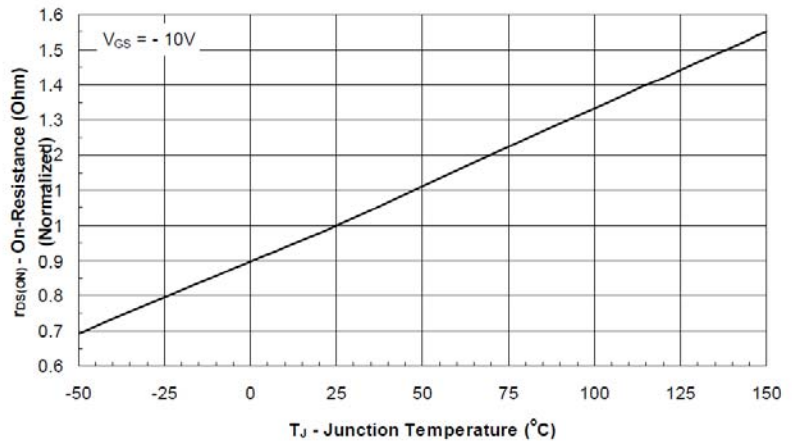
On Resistance Vs Vgs Voltage



Capacitance

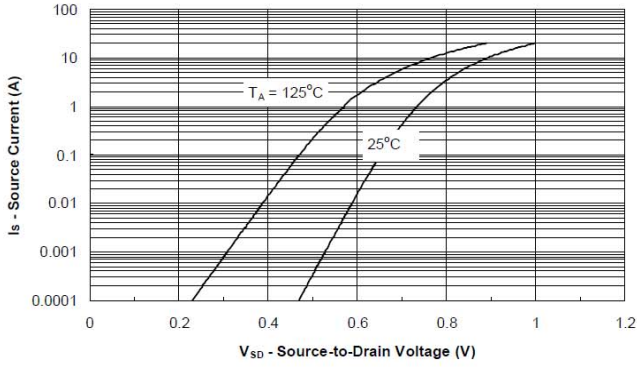


Gate Charge

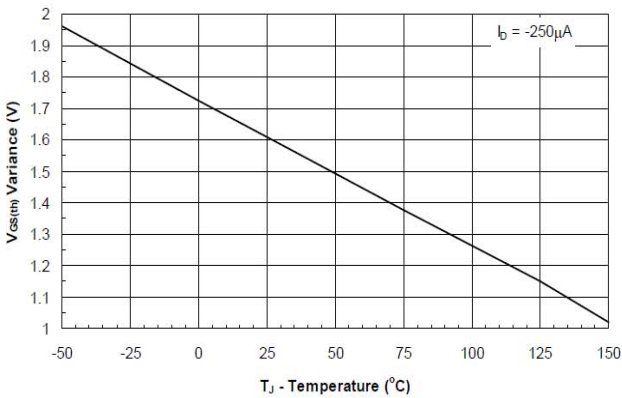


On-Resistance vs. Junction Temperature

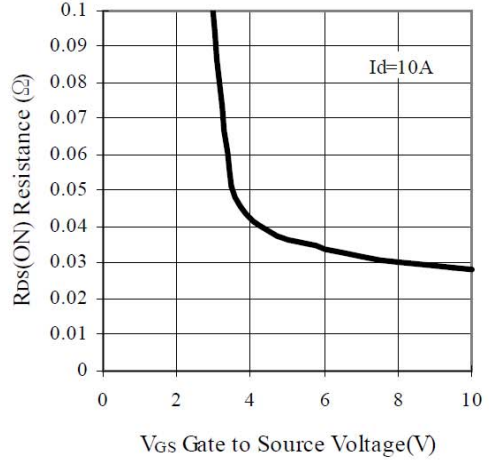
CHARACTERISTIC CURVES



Source-Drain Diode Forward Voltage



Threshold Voltage



On-Resistance with Gate to Source Voltage

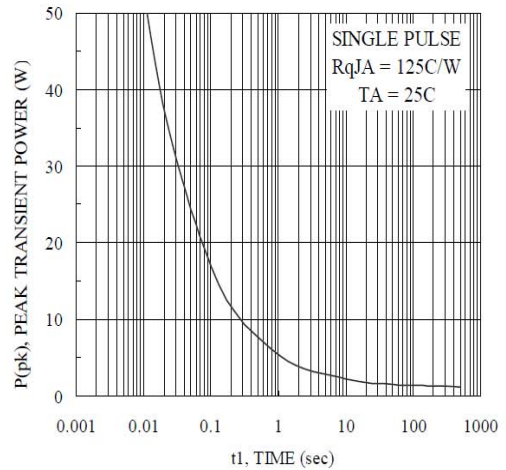


Figure 10. Single Pulse Maximum Power Dissipation

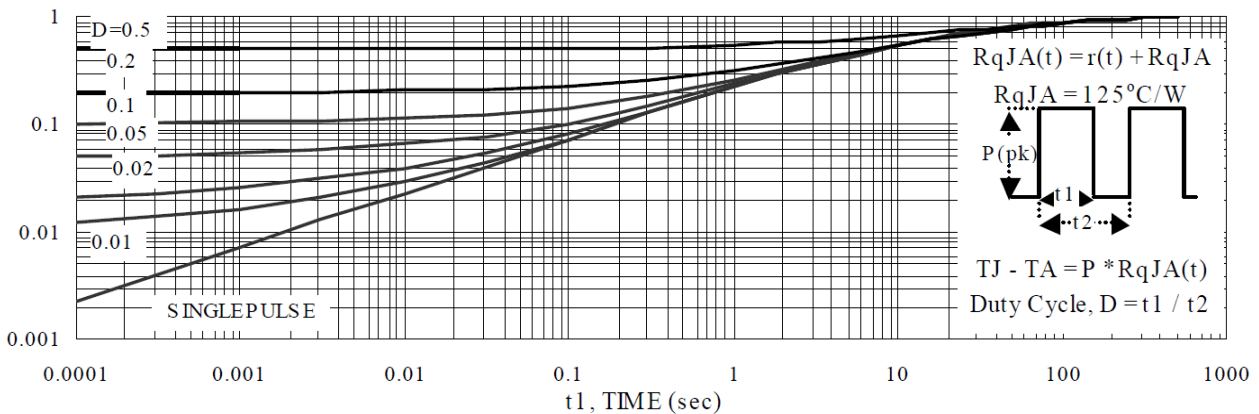


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