Elektronische Bauelemente

SSD57P03-C

-57A, -30V, $R_{DS(ON)}$ 10mΩ
P-Ch Enhancement Mode Power MOSFET

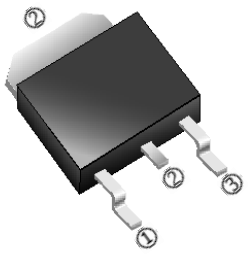
RoHS Compliant Product
A suffix of "-C" specifies halogen free

DESCRIPTION

The SSD57P03-C is the highest performance trench P-Ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The SSD57P03-C meet the RoHS and Green Product with Function reliability approved.

TO-252(D-Pack)

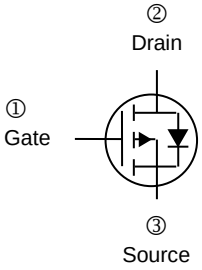


FEATURES

- $R_{DS(on)} \leqq 10m\Omega$ @V_{GS}= -10V
- $R_{DS(on)} \leqq 18m\Omega$ @V_{GS}= -4.5V
- Advanced High Cell Density Trench Technology
- Super Low Gate Charge
- Green Device Available

MARKING

57P03
□□□□ = Date Code



PACKAGE INFORMATION

Package	MPQ	Leader Size
TO-252	2.5K	13 inch

ORDER INFORMATION

Part Number	Type
SSD57P03-C	Lead (Pb)-free and Halogen-free

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

Parameter		Symbol	Ratings		Unit
			10s	Steady State	
Drain-Source Voltage		V_{DS}	-30		V
Gate-Source Voltage		V_{GS}	±20		V
Continuous Drain Current [1] @V_{GS}= -10V	T_C=25°C	I_D	-57		A
	T_C=100°C		-36		
	T_A=25°C		-17.8	-11.3	
	T_A=75°C		-14.2	-9	
Pulsed Drain Current [3]		I_{DM}	-180		A
Power Dissipation [1]	T_C=25°C	P_D	52.1		W
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55~150		°C
Thermal Resistance Ratings					
Maximum Thermal Resistance Junction-Ambient [1]		$R_{\theta JA}$	62.5		°C/W
Maximum Thermal Resistance Junction-Ambient [2]			110		
Maximum Thermal Resistance Junction-Case [1]		$R_{\theta JC}$	2.4		

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

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test conditions
Drain-Source Breakdown Voltage		BV_{DSS}	-30	-	-	V	V_{GS}=0, I_D= -250μA
Gate Threshold Voltage		$V_{GS(th)}$	-1	-	-2.5	V	V_{DS}=V_{GS}, I_D= -250μA
Forward Transfer conductance		g_{fs}	-	26.4	-	S	V_{DS}= -5V, I_D= -30A
Gate-Source Leakage Current		I_{GSS}	-	-	±100	nA	V_{GS}= ±20V
Drain-Source Leakage Current	T_J=25°C	I_{DSS}	-	-	-1	μA	V_{DS}= -24V, V_{GS}=0
	T_J=55°C		-	-	-5		
Static Drain-Source On-Resistance [4]		$R_{DS(ON)}$	-	-	10	mΩ	V_{GS}= -10V, I_D= -30A
			-	-	18		V_{GS}= -4.5V, I_D= -15A
Total Gate Charge		Q_g	-	33	-	nC	I_D= -15A V_{DS}= -15V V_{GS}= -4.5V
Gate-Source Charge		Q_{gs}	-	10.7	-		
Gate-Drain Change		Q_{gd}	-	12.8	-		
Turn-on Delay Time		$T_{d(on)}$	-	8	-	nS	V_{DD}= -15V I_D= -15A V_{GS}= -10V R_G=3.3Ω R_L=1Ω
Rise Time		T_r	-	17.8	-		
Turn-off Delay Time		$T_{d(off)}$	-	78.4	-		
Fall Time		T_f	-	43.6	-		
Input Capacitance		C_{iss}	-	3448	-	pF	V_{GS}=0 V_{DS}= -15V f=1MHz
Output Capacitance		C_{oss}	-	508	-		
Reverse Transfer Capacitance		C_{rss}	-	421	-		
Source-Drain Diode							
Diode Forward Voltage [1]		I_S	-	-	-57	A	
Continuous Source Current [3]		I_{SM}	-	-	-180	A	
Forward On Voltage [4]		V_{SD}	-	-	-1.2	V	I_S= -1A, V_{GS}=0
Reverse Recovery Time		T_{rr}	-	29	-	nS	I_F= -15A, dI/dt=100A/μs T_J=25°C
Reverse Recovery Charge		Q_{rr}	-	15	-	nC	

Notes:
1. The date tested by surface mounted on a 1 inch^2 FR-4 board with 2oz copper.
2. When mounted on Min. copper pad.
3. The power dissipation is limited by 150°C junction temperature.
4. The data tested by pulsed, pulse width≦ 300us, duty cycle≦ 2%.

TYPICAL CHARACTERISTICS CURVE

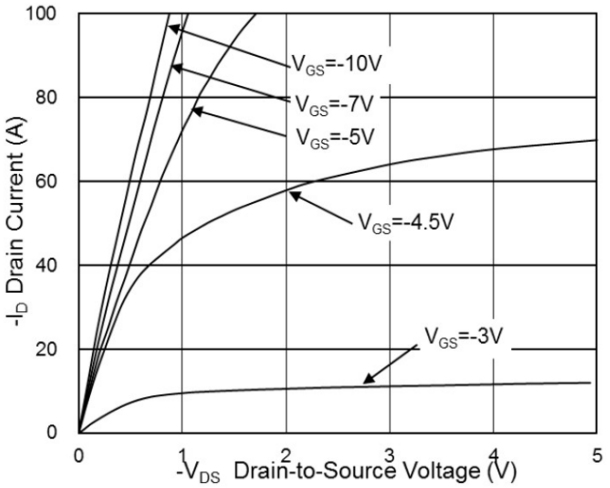


Fig.1 Typical Output Characteristics

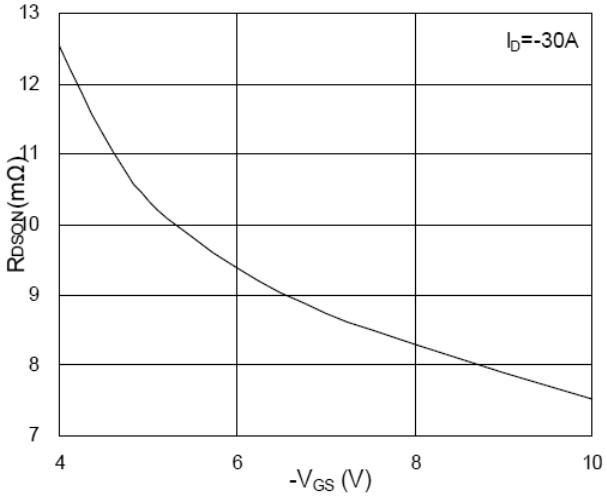


Fig.2 On-Resistance v.s Gate-Source

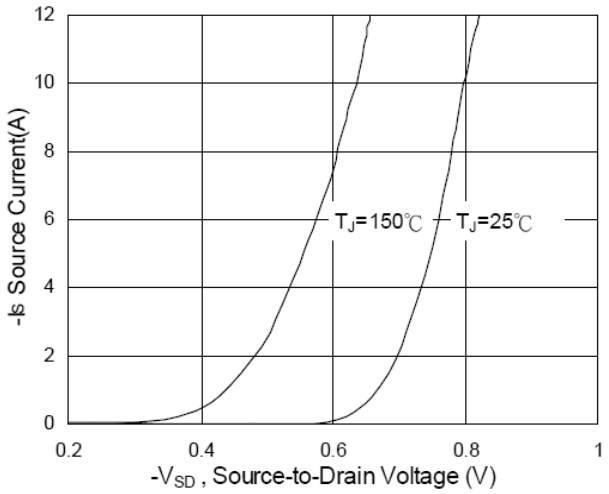


Fig.3 Forward Characteristics Of Reverse

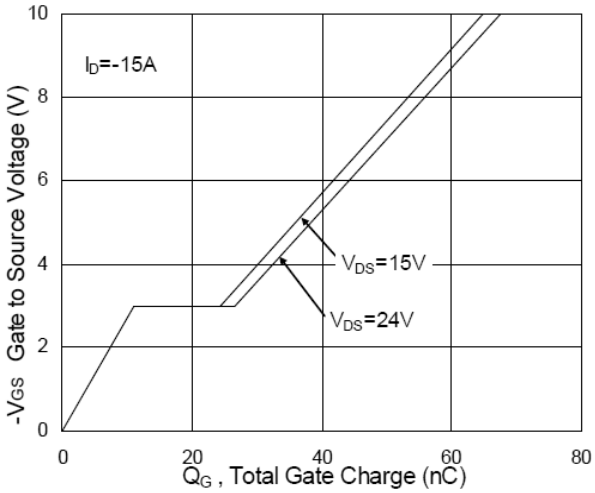


Fig.4 Gate-Charge Characteristics

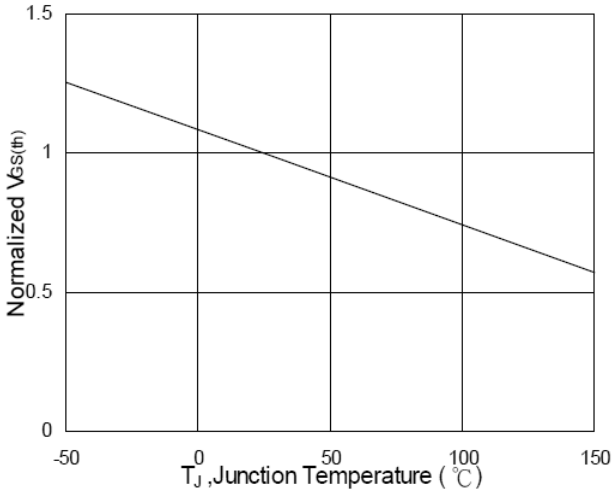


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

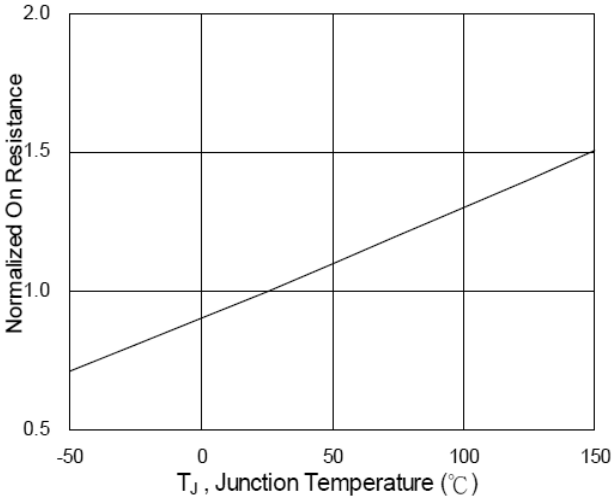


Fig.6 Normalized R_{DSON} v.s T_J

TYPICAL CHARACTERISTICS CURVE

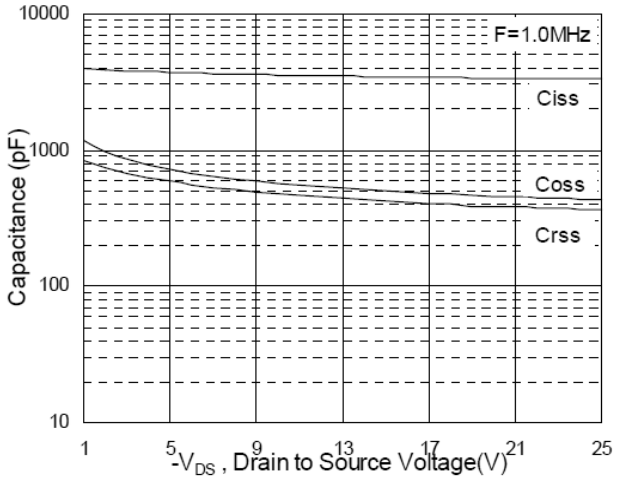


Fig.7 Capacitance

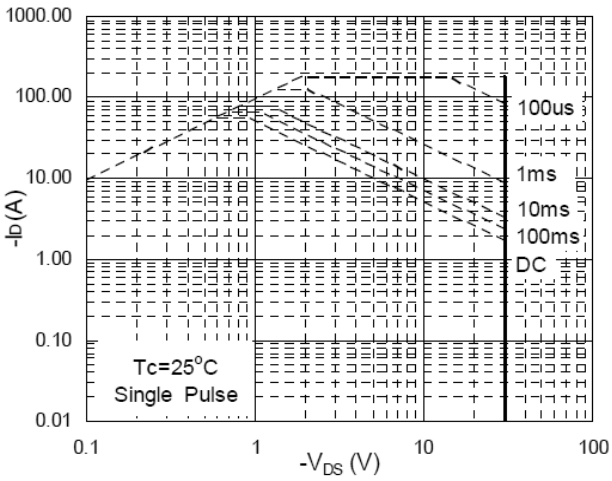


Fig.8 Safe Operating Area

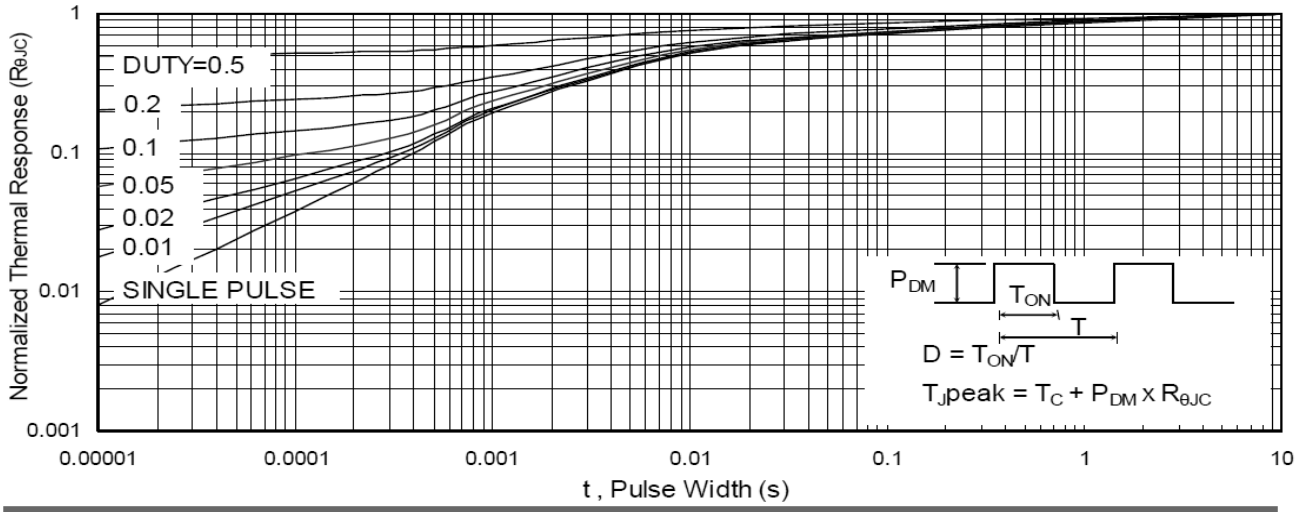


Fig.9 Normalized Maximum Transient Thermal Impedance

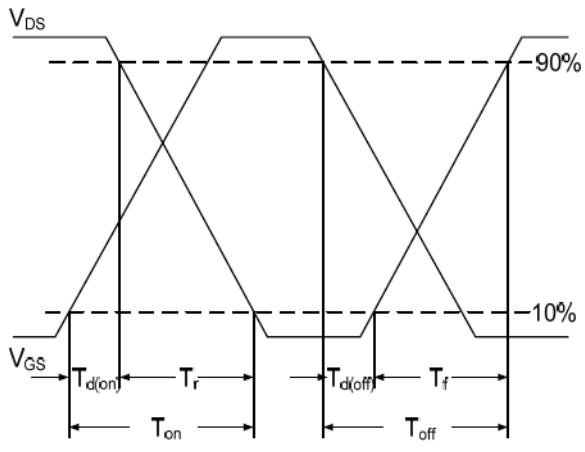


Fig.10 Switching Time Waveform

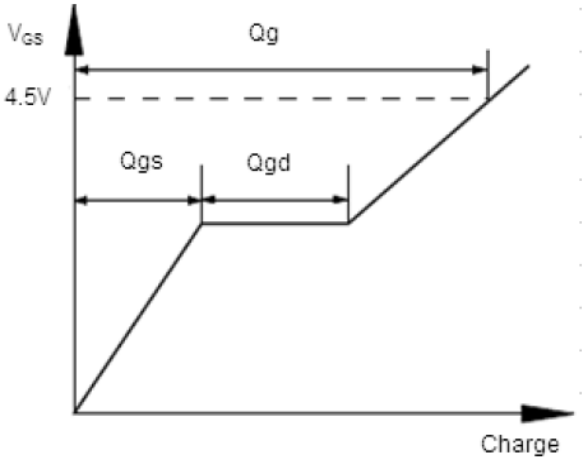
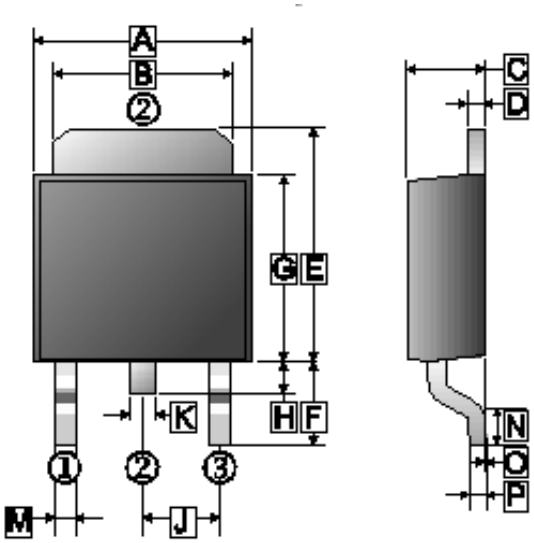


Fig.11 Gate Charge Waveform

PACKAGE OUTLINE DIMENSIONS

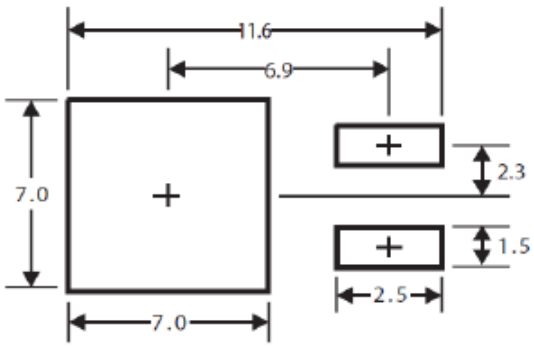
TO-252



REF.	Millimeter	
	Min.	Max.
A	6.30	6.90
B	4.95	5.53
C	2.10	2.50
D	0.40	0.90
E	6.00	7.70
F	2.90 REF.	
G	5.40	6.40
H	0.60	1.20
J	2.30 REF.	
K	0.89 REF.	
M	0.45	1.14
N	1.55 TYP.	
O	0	0.15
P	0.58 REF.	

MOUNTING PAD LAYOUT

TO-252



*Dimensions in millimeters