

Description

The 70P03 is the high cell density trench P-ch MOSFETs, which provide excellent RDS(on) and gate charge for most of the synchronous buck converter applications.

The 70P03 meet the RoHS and Gree Product requirement 100% EAS guaranteed with full function reliability approved.

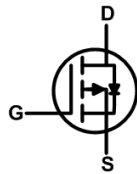
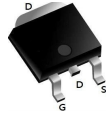
100% EAS Guaranteed

Green Device Available

Super Low Gate Charge

Excellent CdV/dt effect decline

Advanced high cell density Trench technology

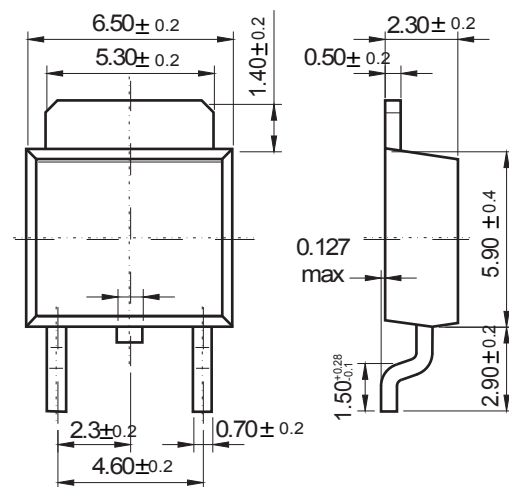


Product Summary

BVDSS	RDS(on)	ID
-30V	5.4mΩ	-70A

TO-252

Unit: mm



Dimensions in inches and (millimeters)

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	-30	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current@-10V ¹	I _D	-70	A
		-42	
Pulsed Drain Current ²	I _{DM}	-175	A
Single Pulse Avalanche Energy ³	EAS	31	mJ
Avalanche Current	I _{AS}	-25	A
Total Power Dissipation ⁴	P _D	31.2	W
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 to+150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ¹	R _{θJA}	43	°C/W
Thermal Resistance from Junction-to-Case ¹	R _{θJC}	4	°C/W

70P03

Electrical Characteristics T_c = 25°C, unless otherwise noted

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		V _{(BR)DSS}	V _{GS} = 0V, I _D = -250μA	-30	-	-	V
Gate-body Leakage current		I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T _J =25°C	I _{DSS}	V _{DS} = -24V, V _{GS} = 0V	-	-	-1	μA
	T _J =55°C			-	-	-5	
Gate-Threshold Voltage		V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1.0	-1.6	-2.5	V
Drain-Source On-Resistance ²		R _{DS(on)}	V _{GS} = -10V, I _D = -12A	-	5.4	7	mΩ
			V _{GS} = -4.5V, I _D = -8A	-	7	10	
Forward Transconductance		g _{fs}	V _{DS} = -5V, I _D = -20A	-	28	-	S
Dynamic Characteristics							
Input Capacitance		C _{iss}	V _{DS} = -15V, V _{GS} =0V, f =1MHz	-	4320	-	pF
Output Capacitance		C _{oss}		-	529	-	
Reverse Transfer Capacitance		C _{rss}		-	487	-	
Switching Characteristics							
Gate Resistance		R _g	V _{DS} = 0V, V _{GS} = 0V, f=1.0MHz	-	4.0	-	Ω
Total Gate Charge		Q _g	V _{GS} = -10V, V _{DS} = -15V, I _D = -15A	-	45	-	nC
Gate-Source Charge		Q _{gs}		-	8.5	-	
Gate-Drain Charge		Q _{gd}		-	12.8	-	
Turn-On Delay Time		t _{d(on)}	V _{GS} = -10V, V _{DD} = -15V, R _G = 2.5Ω, I _D = -15A	-	18.9	-	nS
Rise Time		t _r		-	15.7	-	
Turn-Off Delay Time		t _{d(off)}		-	64.8	-	
Fall Time		t _f		-	36.5	-	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ²		V _{SD}	I _S = -1A, V _{GS} = 0V	-	-	-1	V
Continuous Source Current ^{1,5}		I _S	V _G =V _D =0V , Force Current	-	-	-80	A

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The EAS data shows Max. rating . The test condition is V_{DD}= -25V, V_{GS}= -10V, L= 0.1mH, I_{AS}= -25A
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

RATING AND CHARACTERISTIC CURVES (70P03)

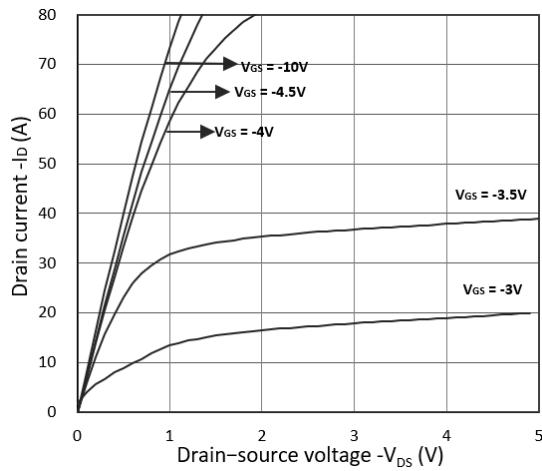


Figure 1. Output Characteristics

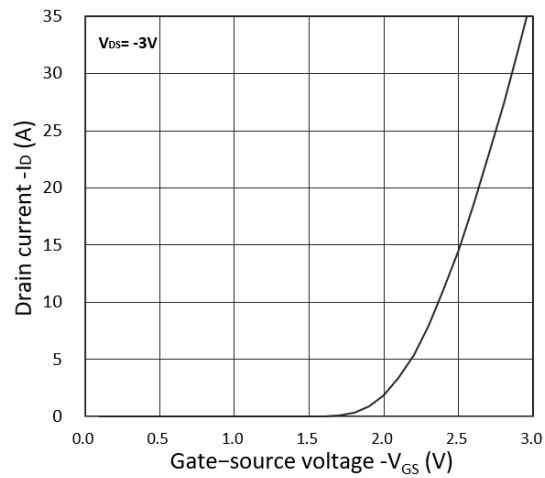


Figure 2. Transfer Characteristics

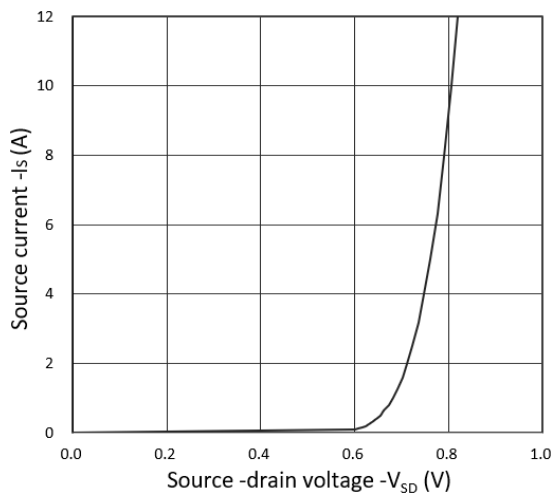


Figure 3. Forward Characteristics of Reverse

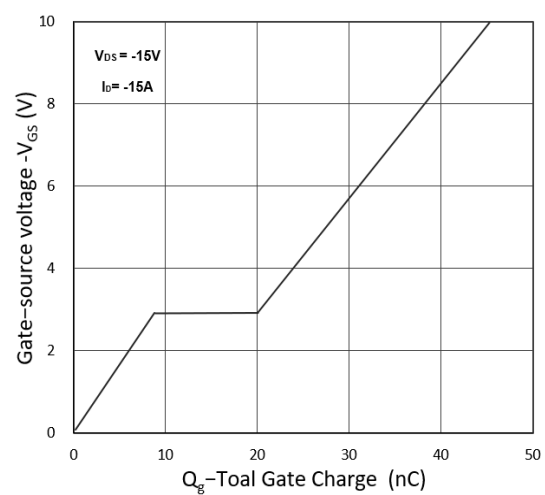


Figure 4. Gate Charge Characteristics

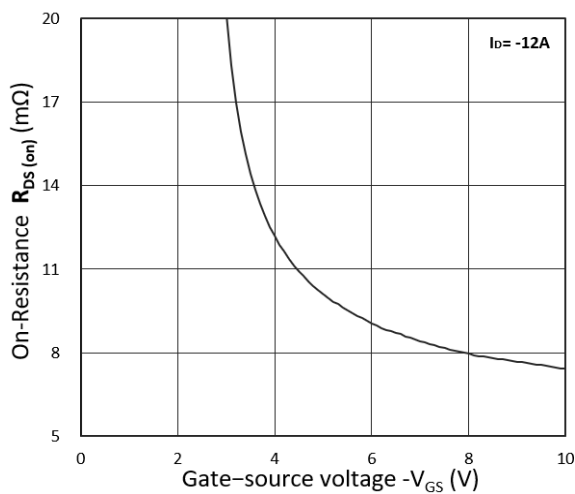


Figure 5. $R_{DS(on)}$ vs. V_{GS}

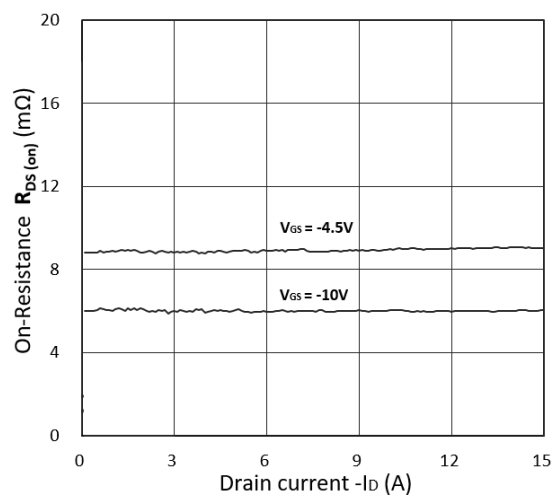


Figure 6. $R_{DS(on)}$ vs. I_D

RATING AND CHARACTERISTIC CURVES (70P03)

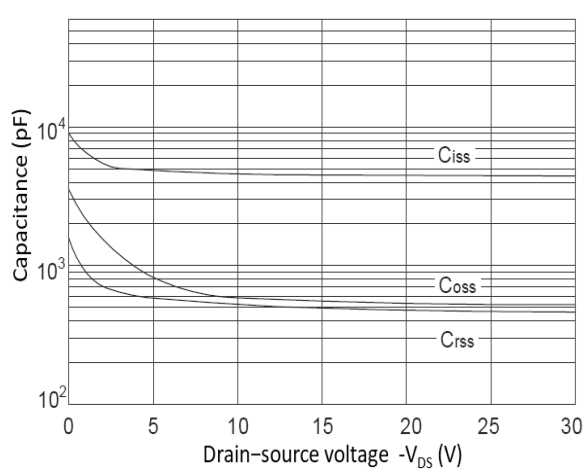


Figure 7. Capacitance Characteristics

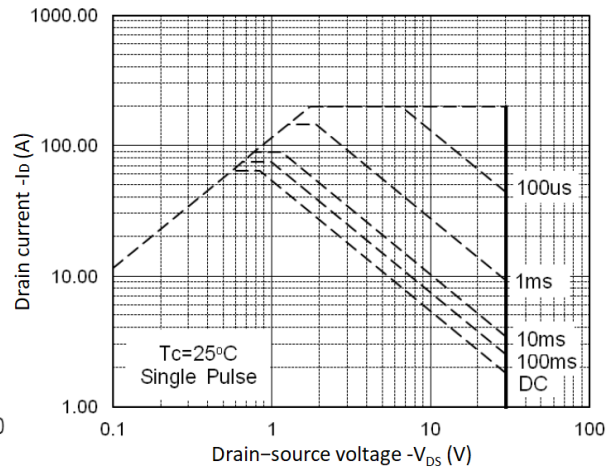


Figure 8. Safe Operating Area

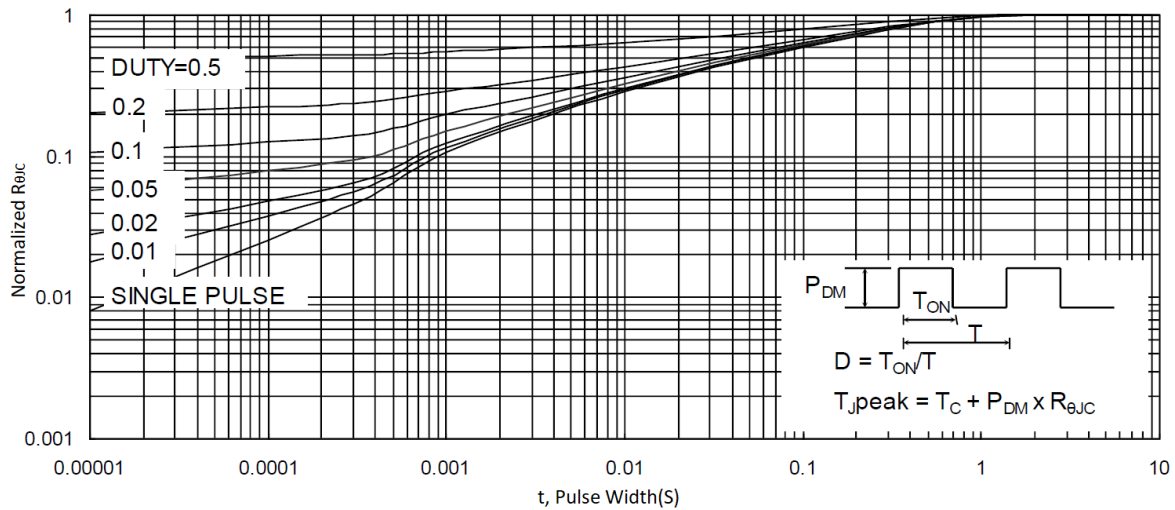


Figure 9. Normalized Maximum Transient Thermal Impedance

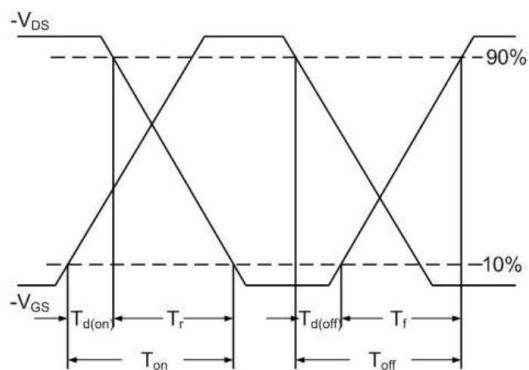


Figure 10. Switching Time Waveform

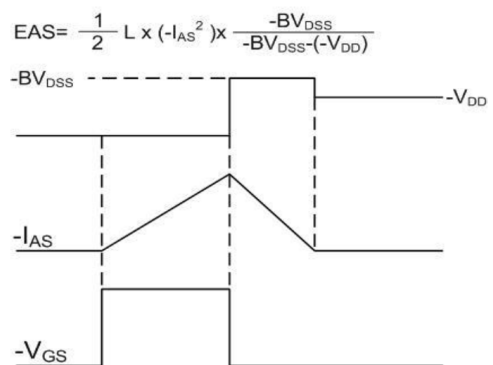
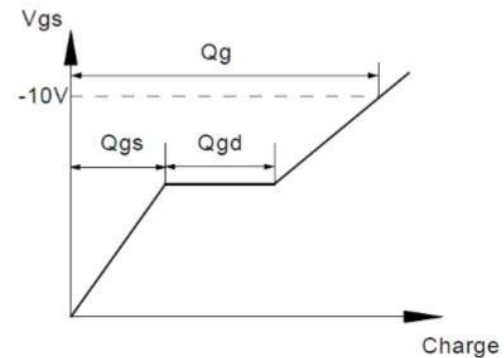
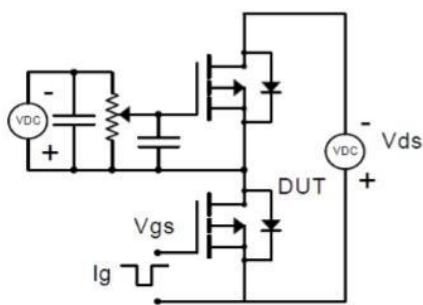


Figure 11. Unclamped Inductive Switching

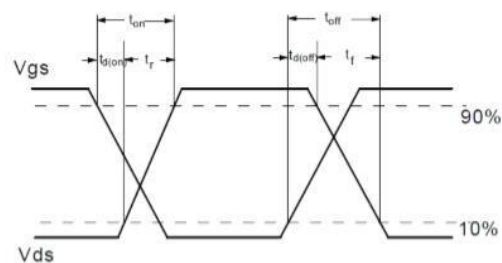
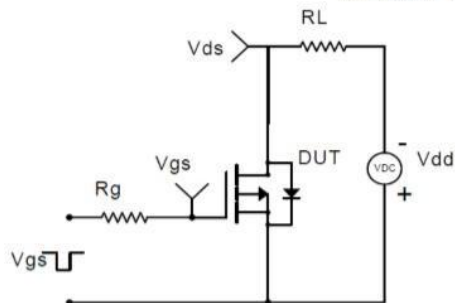
Waveform

Test Circuit

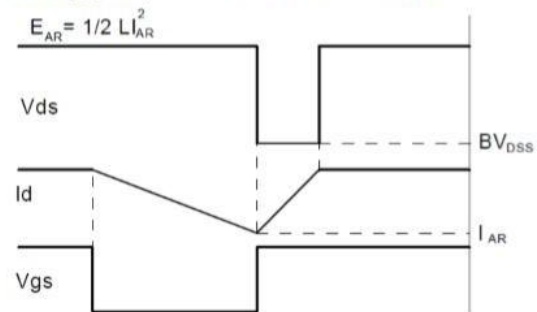
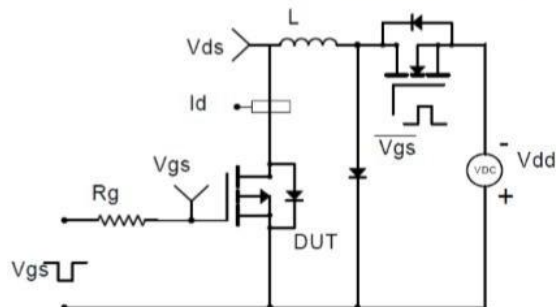
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

