30V P-Channel Enhancement Mode MOSFET

■ *DESCRIPTION*

The BYD50P03 is P channel enhancement mode power effect transitor which is produced using high cell density advanced trench technology.

The high density process is especially able to minize on-state resistance.These devices are. especially suited for low voltage application power management DC-DC converters.

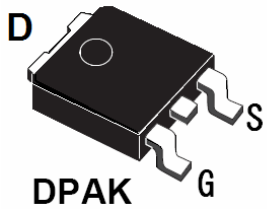
■ *FEATURE*

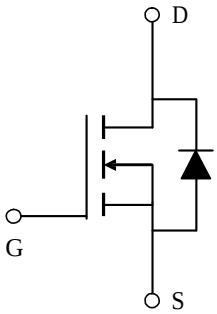
- ***-30V/-50 A, $R_{DS(ON)}$=12m Ω(typ.)@VGS= -10V***
- ***-30V/-35A, $R_{DS(ON)}$=15m Ω(typ.)@VGS= -4.5V***
- Super high design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and Maximum DC current capability
- Full RoHS compliance
- TO252 package design
- 100% UIS Tested
- 100% Rg tested

■ *APPLICATIONS*

- Power Management
- DC/DC Converter
- Load Switch

■ *PIN CONFIGURATION*





■ PART NUMBER INFORMATION

50P03AA-BB C	A= Package Code T: TO-252 BB=Handing Code TR: Tape&Reel C=Lead Plating Code G: Green Product P: Pb free

■ ORDERING INFORMATION

Part Number	Package Code	Package	Shipping
50P03AT-TRG	T	TO-252	2500EA / T&R

※ Year Code : 0~9
※ Week Code : A~Z(1-26); a~z(27~52)
※ G : Green Product. This product is RoHS compliant.

■ ABSOLUTE MAXIMUM RATINGS (T_A = 25℃ Unless otherwise noted)

Symbol	Parameter	Max.	Units
V_{DS}	Drain-to-Source Voltage	-30	V
V_{GS}	Gate-to-Source Voltage	± 20	
I_D @ T_A = 25℃	Continuous Drain Current, V_{GS} @ 10V	-15	A
I_D @ T_A = 70℃	Continuous Drain Current, V_{GS} @ 10V	-12	
I_D @ $T_{C(Bottom)}$ = 25℃	Continuous Drain Current, V_{GS} @ 10V	-50	
I_D @ $T_{C(Bottom)}$ = 100℃	Continuous Drain Current, V_{GS} @ 10V	-35	
I_D @ T_C = 25℃	Continuous Drain Current, V_{GS} @ 10V (Package Limited)	-70	
I_{DM}	Pulsed Drain Current	-100	
P_D @T_A = 25℃	Power Dissipation	2.5	W
P_D @$T_{C(Bottom)}$ = 25℃	Power Dissipation	90	
	Linear Derating Factor	0.03	W/℃
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	℃

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress rating only and functional device operation is not implied

■ *ELECTRICAL CHARACTERISTICS(T_A=25℃ Unless otherwise noted)*

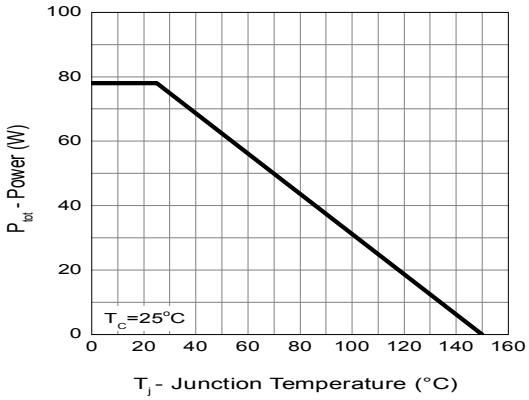
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D= -250uA	-30			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D= -250uA	-1.0		-2.5	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V, V_{GS}=±20V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-30V, V_{GS}=0			-1	uA
		V_{DS}=-30V, V_{GS}=0 T_J=85℃			-5	
$R_{DS(ON)}$	Drain-Source On-Resistance	V_{GS}=-10V, I_D= -15 A		12	15	mΩ
		V_{GS}= -4.5V, I_D= -10 A		15	18	
Source-Drain Diode						
V_{SD}	Diode Forward Voltage	I_S= -1 A, V_{GS}=0V		0.7	1.3	V
Dynamic Parameters						
Q_g	Total Gate Charge	V_{DS}= -15V V_{GS}= -10V I_D=-20 A		53		nC
Q_{gs}	Gate-Source Charge			23		
Q_{gd}	Gate-Drain Charge			13		
C_{iss}	Input Capacitance	V_{DS}= -15V V_{GS}=0V f=1MHz		2886		pF
C_{oss}	Output Capacitance			640		
C_{rss}	Reverse Transfer Capacitance			440		
$T_{d(on)}$	Turn-On Time	V_{DS}= -15V R_L=0.75Ω V_{GEN}=-10V R_G=3.0Ω		19		nS
T_r				15		
$T_{d(off)}$	Turn-Off Time			52		
T_f				17		

Note: 1. Pulse test: pulse width<=300uS, duty cycle<=2%

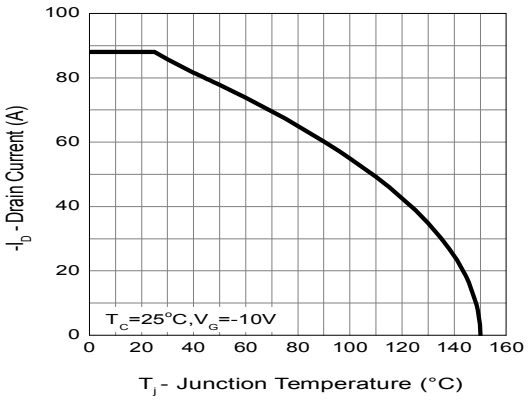
2.Static parameters are based on package level with recommended wire bonding

■ *TYPICAL CHARACTERISTICS (25℃ Unless Note)*

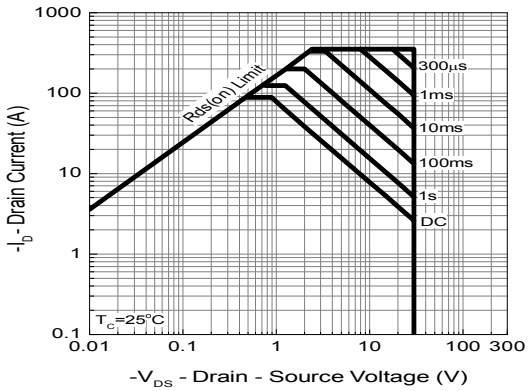
Power Dissipation



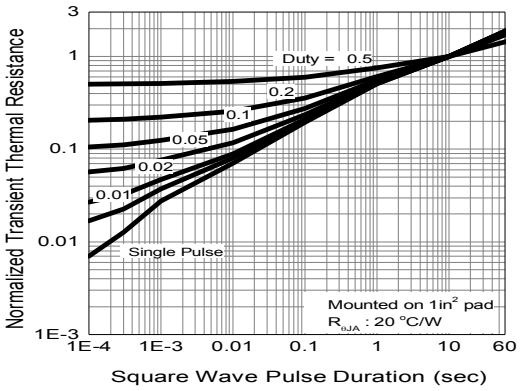
Drain Current



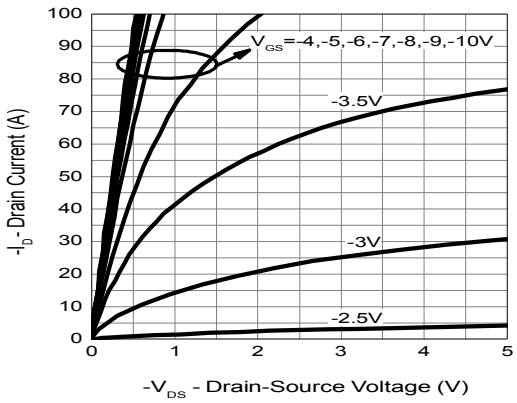
Safe Operation Area



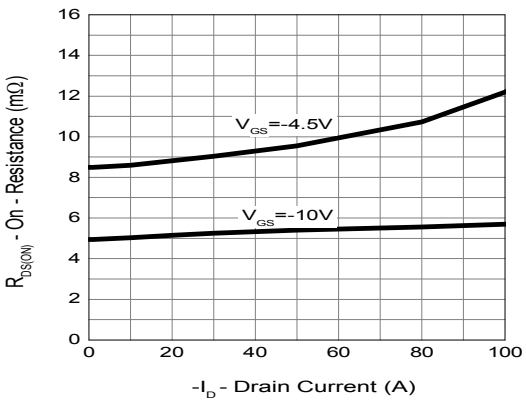
Thermal Transient Impedance



Output Characteristics

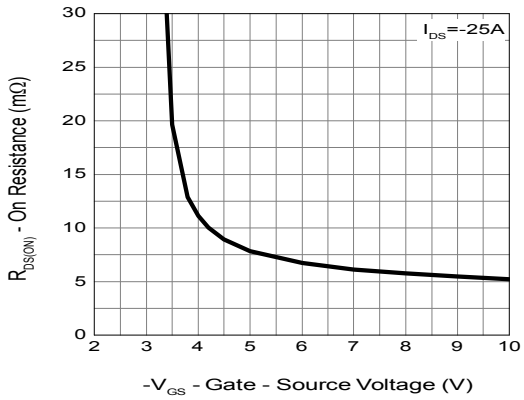


Drain-Source On Resistance

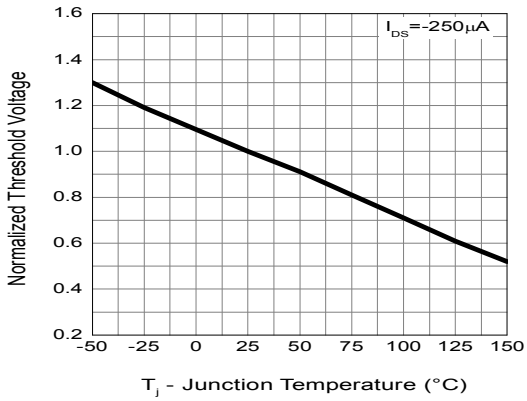


■ *TYPICAL CHARACTERISTICS (continuous)*

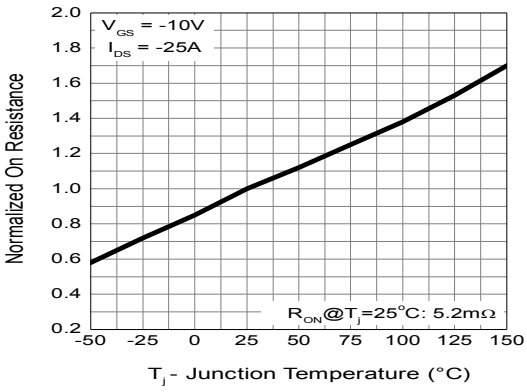
Gate-Source On Resistance



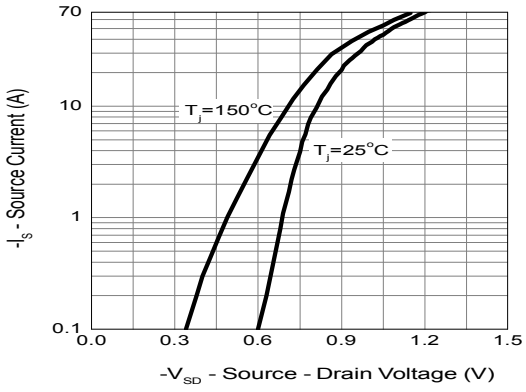
Gate Threshold Voltage



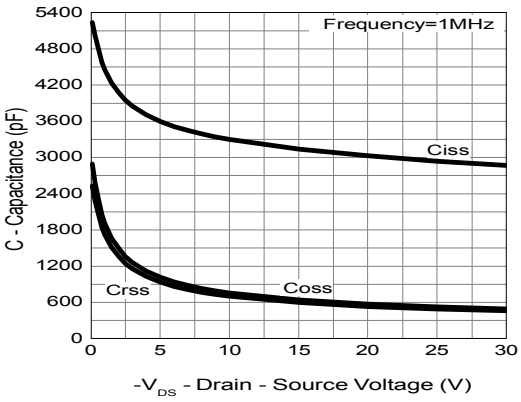
Drain-Source On Resistance



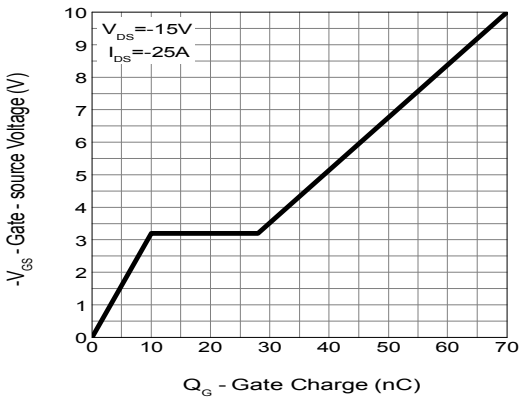
Source-Drain Diode Forward



Capacitance

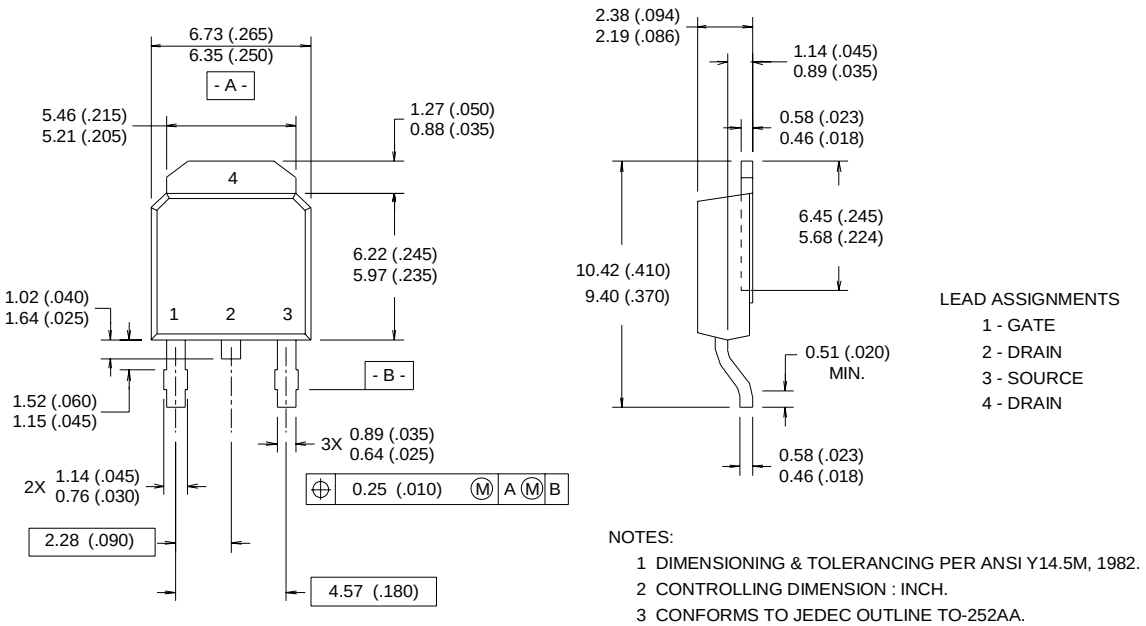


Gate Charge



■ TO-252 Outline Package Dimension

Dimensions are shown in millimeters (inches)



LEAD ASSIGNMENTS
1 - GATE
2 - DRAIN
3 - SOURCE
4 - DRAIN

NOTES:
1 DIMENSIONING & TOLERANCING PER ANSI Y14.5M, 1982.
2 CONTROLLING DIMENSION : INCH.
3 CONFORMS TO JEDEC OUTLINE TO-252AA.
4 DIMENSIONS SHOWN ARE BEFORE SOLDER DIP, SOLDER DIP MAX. +0.16 (.006).