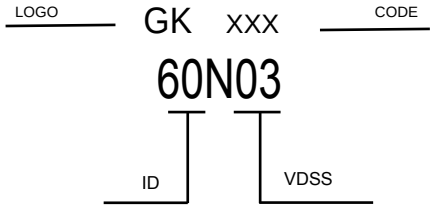
V_{DSS} 30 V
I_D
$R_{DS(ON)}$ 6.7mΩ

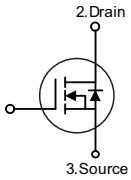
FEATURES

100% EAS Guaranteed
Green Device Available
Super Low Gate Charge
Excellent CdV/dt effect decline
Advanced high cell density Trench technology









DESCRIPTION

The 60N03 is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The 60N03 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	60	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	32	A
I_{DM}	Pulsed Drain Current[2]	200	A
P_D@T_A=25℃	Total Power Dissipation[4]	34	W
P_D@T_A=100℃	Total Power Dissipation[4]	14	W
E_{AS}	Single Pulse Avalanche Energy[3]	95	mJ
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	3.7	℃/W

Electrical characteristics (T_J=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V , V_{GS}=0V , T_J=25℃	---	---	1	uA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V , V_{GS}=0V , T_J=125℃	---	---	100	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=250uA	1.0	---	2.5	V
g_{FS}	Forward Transconductance	V_{DS}=5V , I_D=20A	---	18	---	S
$R_{DS(ON)}$	Drain-Source On-State Resistance[2]	V_{GS}=10V , I_D=20A , T_J=25℃	---	6.7	8.7	mΩ
		V_{GS}=4.5V , I_D=15A , T_J=25℃	---	9.7	12.9	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1.0MHz	---	1264	---	pF
C_{oss}	Output Capacitance		---	254	---	
C_{rss}	Reverse Transfer Capacitance		---	201	---	
R_g	Gate Resistance	V_{GS}=0V , V_{DS}=0V , f=1.0MHz	---	1.8	---	Ω
$T_{d(on)}$	Turn-On Delay Time	V_{GS}=10V , V_{DS}=15V , R_L=0.75Ω , R_{GEN}=3Ω	---	12	---	ns
T_r	Turn-On Rise Time		---	2.4	---	
$T_{d(off)}$	Turn-Off Delay Time		---	30.4	---	
T_f	Turn-Off Fall Time		---	4	---	
Q_g	Total Gate Charge	V_{GS}=10V , V_{DS}=15V , I_D=20A	---	21.6	---	nC
Q_{gs}	Gate-Source Charge		---	2.7	---	
Q_{gd}	Gate-Drain Charge		---	4.7	---	

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_{SD}	Source-Drain Current (Body Diode)		---	---	60	A
V_{SD}	Forward on Voltage[3]	V_{GS}=0V , I_S=20A	---	---	1.2	V
t_{rr}	Reverse Recovery Time	I_F=20A , dI/dt=500A/μs	---	19.4	---	ns
Q_{rr}	Reverse Recovery Charge	I_F=20A , dI/dt=500A/μs	---	11.6	---	nC

1.The data tested by surface mounted on a 1 inch^2 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}=30V,V_{GS}=10V,L=0.5mH
4.The power dissipation is limited by 150℃ junction temperature

RATING AND CHARACTERISTIC CURVES

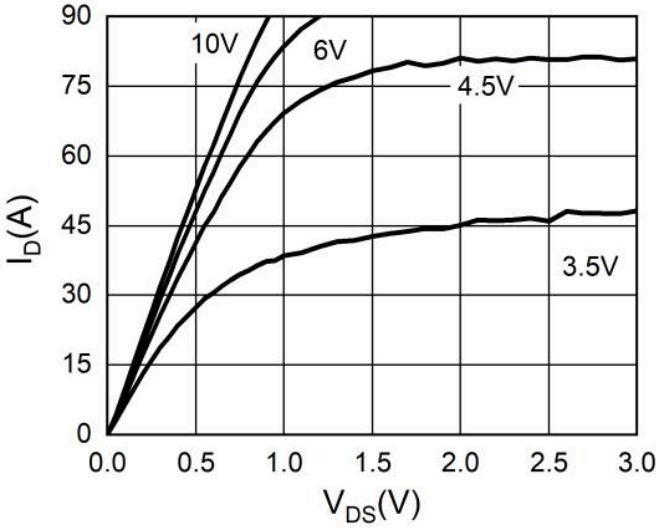


Fig.1 Typical Output Characteristics

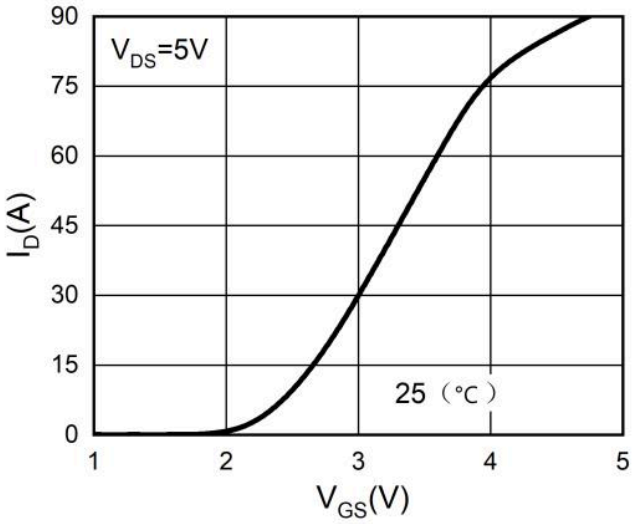


Fig.2 Transfer Characteristics

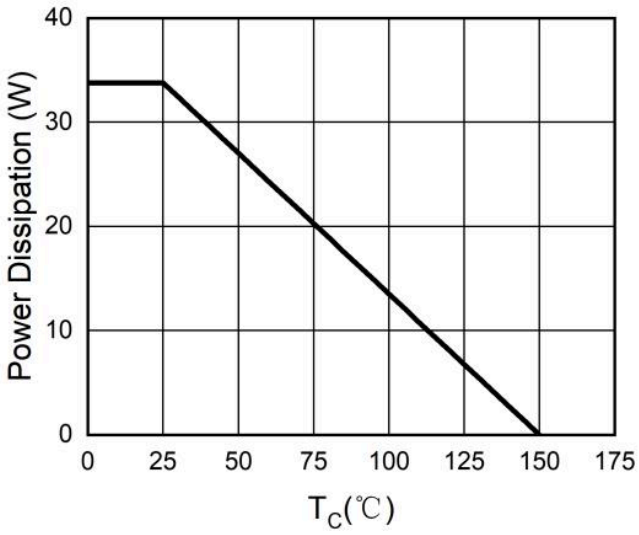


Fig.3 Power Dissipation

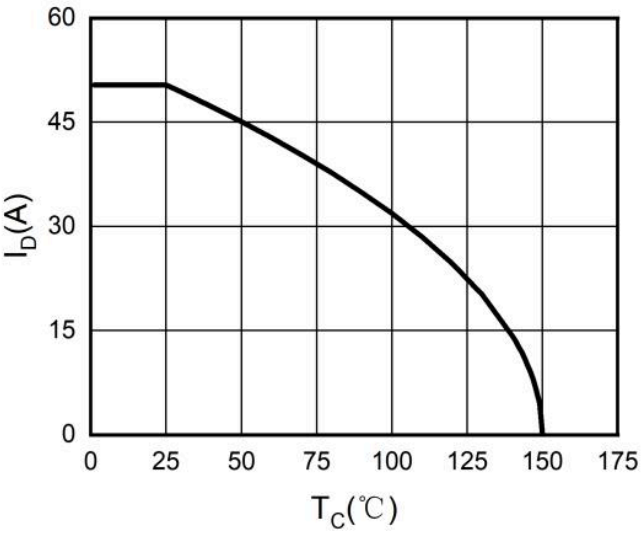


Fig.4 Drain Current

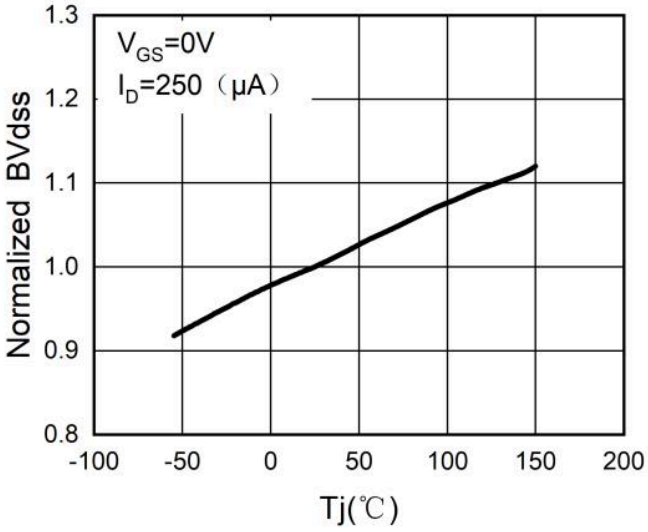


Fig.5 BV_{DSS} vs. Junction Temperature

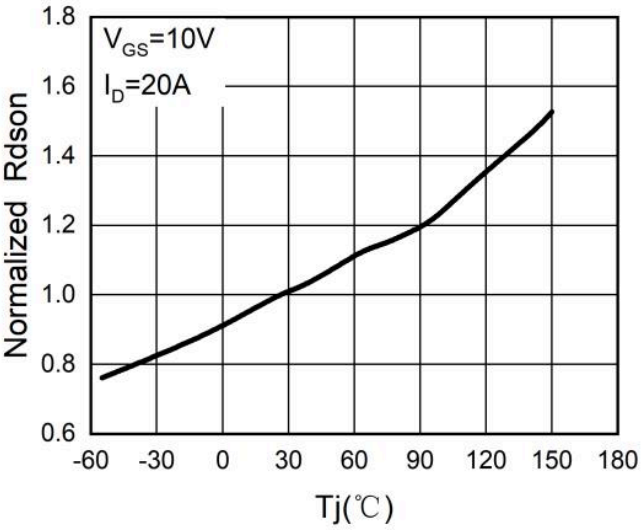


Fig.6 $R_{DS(ON)}$ vs. Junction Temperature

RATING AND CHARACTERISTIC CURVES

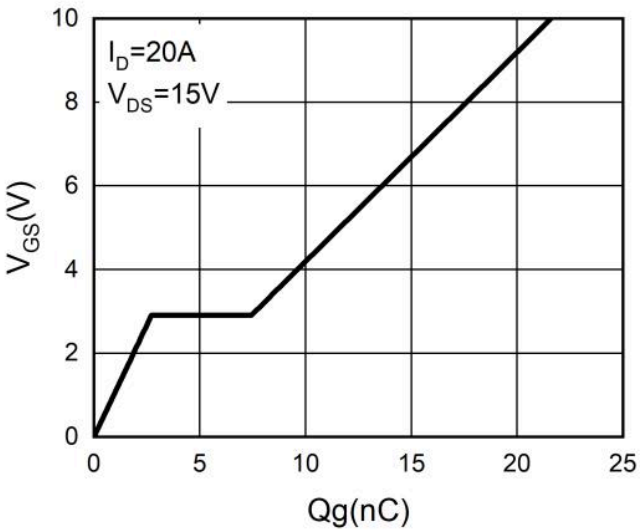


Fig.7 Gate-Charge Characteristics

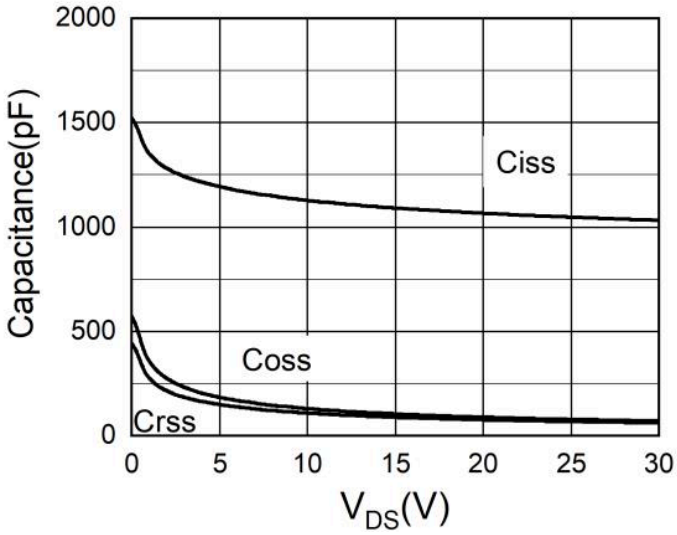


Fig.8 Capacitance

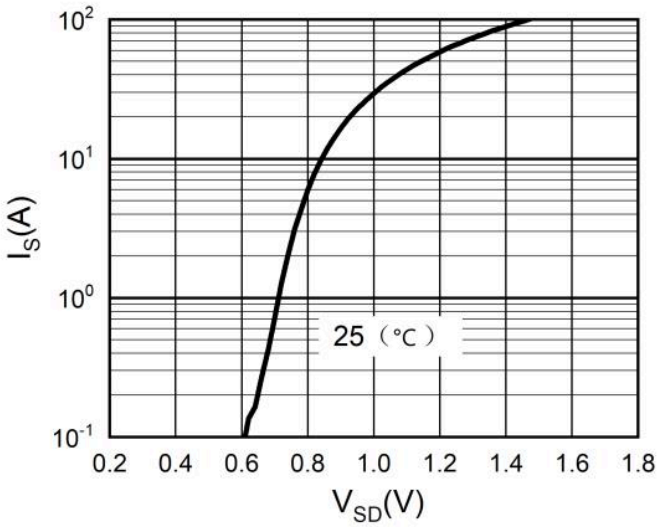


Fig.9 Body-Diode Characteristics

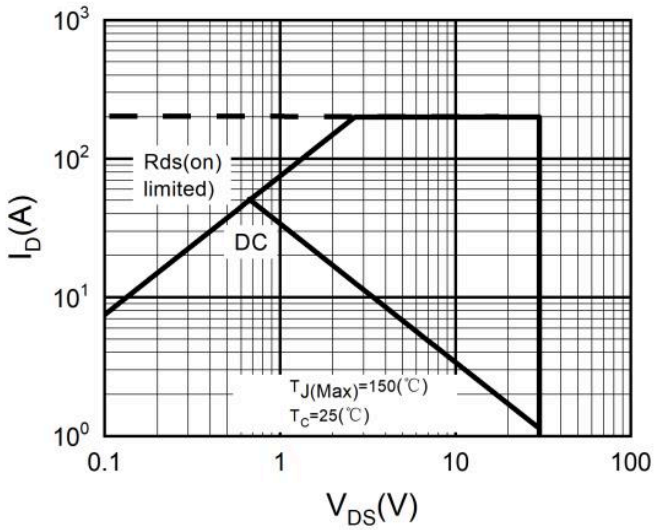
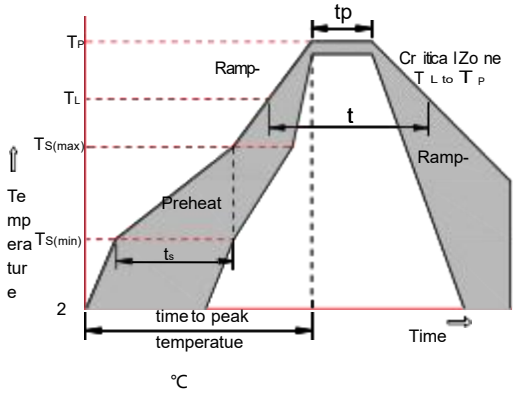


Fig.10 Maximum Safe Operating Area

Soldering parameters

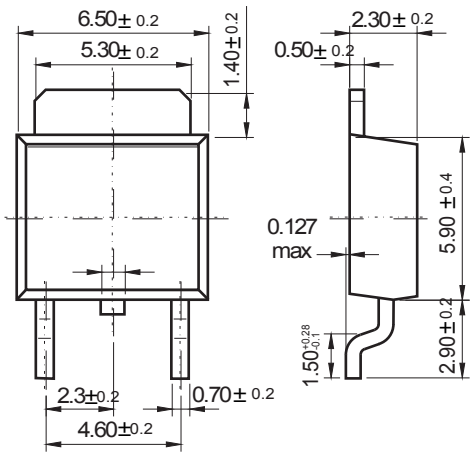
Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃ of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃

FIG5: Reflow condition

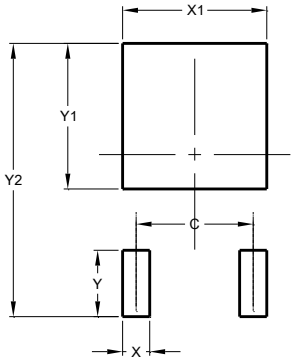


Package Dimensions & Suggested Pad Layout

TO-252



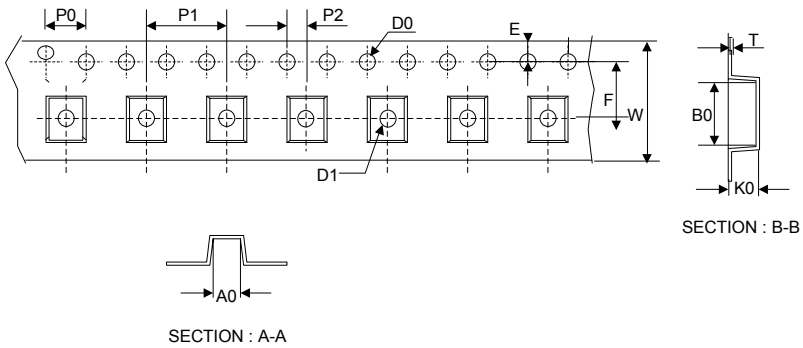
Dimensions in inches and (millimeters)



Dimensions	Value (in mm)
C	4.55
X	1.50
X1	5.80
Y	2.70
Y1	6.00
Y2	10.90

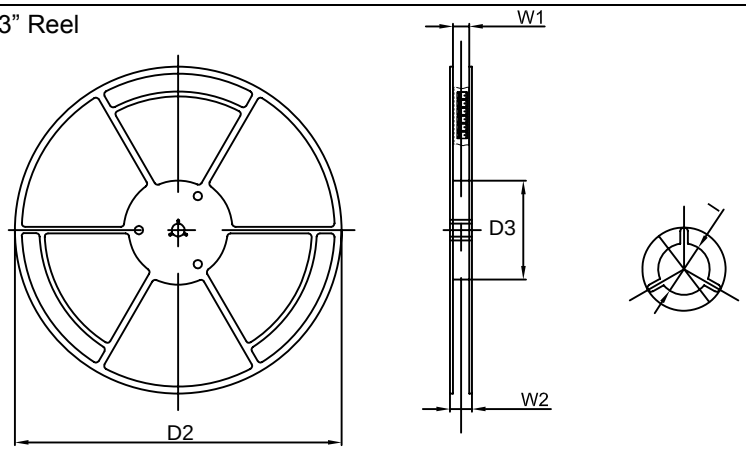
Tape & rell specification

Tape



Symbol	Dimension (mm)
P0	4.00±0.20
P1	8.00±0.20
P2	2.00±0.20
D0	1.55±0.15
D1	1.55±0.20
E	1.75±0.20
F	7.50±0.20
W	16.00±0.20
A0	7.10±0.20
B0	10.50±0.20
K0	2.70±0.20
T	0.30±0.10

13” Reel



D2	330.0±5.0
D3	100.0±4.0
W1	20.0±5.0
W2	25.0±5.0
I	13.0±2.0

Quantity: 2500PCS