

## Taiwan Semiconductor Co., Ltd.

### Product/ Process Change Notification

<b>1. PCN No.:</b>	<i>QPCN09010</i>
<b>2. Subject:</b>	<i>MUR160 die size change notification</i>
<b>3. To:</b>	<i>Sales</i>
<b>4. Issued by:</b>	Ben Wang
<b>5. Issue date:</b>	2009/9/1
<b>6. Proposed first ship date for change:</b>	2009/12/1
<b>7. Affected Product Identification</b>	
<i>MUR160</i>	
<b>8. Change Description : (OLD Vs. NEW Comparison)</b>	
Old:	New:
1. 60 mil 600V HER GPP die (PG/ EPI)	1. 50 mil 600V HER GPP die (PG/ EPI)
<b>9. Reason for Change:</b>	
Upgrade wafer capability/efficiency.	
<b>10. Anticipated Impact:</b> (form, fit, function, quality or reliability)	
<i>A. There is no effect on external dimension.          B. There is no effect on electrical performance.          C. There is no effect on Hi-rel performance.</i>	
<b>11. Qualification plan/result:</b>	
<i>Refer to the Attachment</i>	
<b>12. Sample availability Date:</b>	<u>2009/9/1</u>
<b>13. Tentative implementation date:</b>	<u>2010/2/1</u>
<b>14. Remarks</b>	
<b>15. Customer feedback required latest:</b> (should we receive no feedback, the change will be deemed as accepted!)	<b>2009/10/1</b>
<b>16. Approved by:</b>	<b>L.C.Kao</b>



## Customer Approval Form\_QPCN09010:

(Please tick the field what is valid for you!)

<input type="checkbox"/> <b>We agree with this proposed change and its schedule.</b>			
<input type="checkbox"/> <b>We have objections</b>			
<input type="checkbox"/> <b>We need more information:</b>			
<input type="checkbox"/> <b>We need sample:</b>			
<b>Company:</b>			
<b>Name:</b>			
<b>Address:</b>			
<b>Signature:</b>			<b>Date:</b>

(YWSB8460)

## Attachment -PCN#: QPCN09010

### PCN Type: MUR160 die size change Notification

Data sheet change: None

### Detailed of change:

This PCN is to advise our (TSC) customer that TSC will change MUR160 die size from 82mil (PG/ EPI) to 70mil (PG/ EPI). We have done hi-reliability test to verify the wafer's qualification. And the result is very encouraged.

### Qualification Result:

#### HER GPP 600V 60mil wafer VS HER GPP 600V 50mil wafer (MUR160):

#### 1. Parameter Verification (Three lots)

HER GPP 60mil EPI die:

Lot#1: C2-090113-013

Test Item	Test Condition	Low Limit	Up Limit	Min	Max	Average	Sigma	CPK
VR	@IR=5uA	600V	-	649	789	737.896	20.913	2.20
VF	@IF=1A	-	1.25V	0.976	1.096	1.035	0.024	2.96
IR	@VR=600V	-	5uA	0.004	0.183	0.009	0.008	200.60
TRR	@IRR=0.25A	-	50ns	29	39	32.994	1.504	3.77

Lot#2: C2-090113-014

Test Item	Test Condition	Low Limit	Up Limit	Min	Max	Average	Sigma	CPK
VR	@IR=5uA	600V	-	652	793	739.254	21.313	2.18
VF	@IF=1A	-	1.25V	0.975	1.093	1.036	0.026	2.72
IR	@VR=600V	-	5uA	0	0.185	0.009	0.009	179.01
TRR	@IRR=0.25A	-	50ns	30	39	33.594	1.454	3.76

Lot#3: C2-090113-015

Test Item	Test Condition	Low Limit	Up Limit	Min	Max	Average	Sigma	CPK
VR	@IR=5uA	600V	-	647	790	735.896	19.913	2.27
VF	@IF=1A	-	1.25V	0.974	1.095	1.034	0.021	3.39

IR	@VR=600V	-	5uA	0	0.183	0.009	0.009	184.24
TRR	@IRR=0.25A	-	50ns	29	38	32.594	1.304	4.45

HER GPP 50mil die:

Lot#1: C2-090313-003

Test Item	Test Condition	Low Limit	Up Limit	Min	Max	Average	Sigma	CPK
VR	@IR=5uA	600V	-	631	778	733.972	15.620	2.86
VF	@IF=1A	-	1.25V	0.982	1.096	1.036	0.018	3.90
IR	@VR=600V	-	5uA	0.003	0.137	0.007	0.006	265.43
TRR	@IRR=0.25A	-	50ns	28	34	30.512	0.848	7.66

Lot#2: C2-090313-004

Test Item	Test Condition	Low Limit	Up Limit	Min	Max	Average	Sigma	CPK
VR	@IR=5uA	600V	-	633	781	735.876	15.562	2.91
VF	@IF=1A	-	1.25V	0.978	1.095	1.033	0.016	4.44
IR	@VR=600V	-	5uA	0	0.135	0.006	0.005	315.83
TRR	@IRR=0.25A	-	50ns	28	34	30.312	0.748	8.78

Lot#3: C2-090313-005

Test Item	Test Condition	Low Limit	Up Limit	Min	Max	Average	Sigma	CPK
VR	@IR=5uA	600V	-	635	775	734.972	16.320	2.76
VF	@IF=1A	-	1.25V	0.981	1.095	1.037	0.019	3.68
IR	@VR=600V	-	5uA	0	0.141	0.007	0.007	228.91
TRR	@IRR=0.25A	-	50ns	28	35	31.212	0.925	6.77

## 2. F.S Capability Test Result (Spec 35A)

IFSM(A)	35	40	45	50	55	60	65	70
50mil	0/10	0/10	0/10	0/10	3/10	5/7	2/2	-
60mil	0/10	0/10	0/10	0/10	0/10	4/10	4/6	2/2

## 3. Qualification data

3.1 60 mil 600V HERGPP die qualification performance:

Test Description	Test Condition	# Lot	# Tested	# Failed	Result
HTRB	JESD22-A108	3	231	0	Passed
H3TRB	JESD22-A101	3	231	0	Passed
RSH	JESD22-B106	3	90	0	Passed
TC	JESD22-A104	3	231	0	Passed
AC	JESD22-A102	3	231	0	Passed
I.O.L	MIL-STD-750 Method 1073	3	231	0	Passed
DPA	Per AEC-Q101	3	6	0	Passed

3.2 50 mil 600V HERGPP die qualification performance:

Test Description	Test Condition	# Lot	# Tested	# Failed	Result
HTRB	JESD22-A108	3	231	0	Passed
H3TRB	JESD22-A101	3	231	0	Passed
RSH	JESD22-B106	3	90	0	Passed
TC	JESD22-A104	3	231	0	Passed
AC	JESD22-A102	3	231	0	Passed
I.O.L	MIL-STD-750 Method 1073	3	231	0	Passed
DPA	Per AEC-Q101	3	6	0	Passed

## Affected Part Number:

Part Number	Package
<b>MUR160</b>	<b>DO-15</b>