



MEDIATEK

CONFIDENTIAL B

Basic Tuning Flow – LSC/TSE Calibration

Shading calibration – Calibration

NVRAM Control

Read Apply Save

Tuning Control

Mode : **Capture**

Color Temp

☐ Fixed ☐ Reserve

☒ High ☐ Middle ☐ Low

Parameter Control

Coef Poly : 0.95 Adv. Para

Import SDBLK Export SDBLK Calculate

NVRAM Control

Read Apply Save

Tuning Control

Mode : **Capture**

Color Temp

☐ Fixed ☐ Reserve

☒ High ☐ Middle ☐ Low

Parameter Control

Coef Poly : 0.95

Import

Parameter

Variable

Sdblk Trig

ShadingEn

ShadingblkOffset

ShadingblkOffset

ShadingblkNumX

ShadingblkNumY

ShadingblkWidth

ShadingblkHeight

Parameter Control

Coef Poly : 0.95 Adv. Para

Import SDBLK Export SDBLK Calculate

Parameter

Variable	Value	Modify
ShadingblkOffsetX	0	
ShadingblkOffsetY	0	
ShadingblkNumX	16	
ShadingblkNumY	16	
ShadingblkWidth	102	
ShadingblkHeight	76	
Sd_IWidth	102	
Sd_IHeight	84	

0x001C0029 0x00000044 0x00020000 0x00610000

0x85950000 0x3F45831D 0x000B0004 0x0000005B

0x00000000 0x00D30000 0x85FF0000 0x4083831C

0x00150026 0x0000004E 0x00100000 0x00850000

0x85C80000 0x409A8349 0x001E0019 0x0000005B

0x80080000 0x007F0000 0x85FE0000 0x401D8308

0x8025807A 0x007B001C 0x001E0000 0x011D00CC

0x84C90000 0x34A38292 0x80098032 0x000D800E

0x000B0000 0x00F40112 0x84EE0000 0x353B8245

0x80318078 0x0072000A 0x00250000 0x013D00E9

- 1) Sensor mode : Capture
- 2) Color temperature
- 3) Compensation ratio
(Suggestion : 80~90%)
- 4) Detail parameters
- 5) Calculate for calibration

Tuning Parameter

Offset

Start X : 0

Start Y : 0

End X : 0

End Y : 0

Block

M : 16

N : 16

OK Cancel

Shading calibration – Result Picture

NVRAM Control

Read Apply Save

Tuning Control

Mode : Capture

Color Temp

☐ Fixed ☐ Reserve

☒ High ☐ Middle ☐ Low

Parameter Control

Coef Poly : 0.95 Adv. Para

Import SDBLK Export SDBLK Calculate

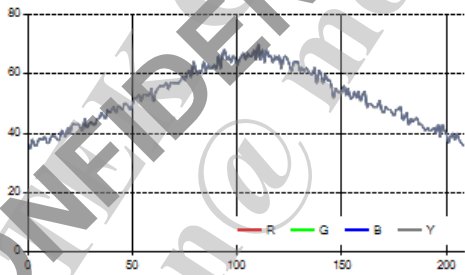
Parameter

Variable	Value	Modify
ShadingblkOffsetX	0	
ShadingblkOffsetY	0	
ShadingblkNumX	16	
ShadingblkNumY	16	
ShadingblkWidth	130	
ShadingblkHeight	97	
Sd_Width	130	
Sd_Height	105	

0x80128014 0x00000015 0x00130000 0x00600000
0x81320000 0x1DFA80C9 0x800D8012 0x0000001D
0x00120000 0x00530000 0x81B30000 0x235980FF
0x800D8012 0x0000001D 0x00120000 0x00530000
0x81B30000 0x235980FF 0x00040005 0x00000003
0x00070000 0x80120000 0x80D20000 0x1CA68082
0x00070021 0x803D8017 0x00000000 0x000A003E
0x80F50000 0x1BBF807D 0x0008001F 0x8035801F
0x00050000 0x000A0057 0x815C0000 0x202D80BE
0x0008001F 0x8035801F 0x00050000 0x000A0057

Image Analysis

Verification



Position	AvgR	AvgG	AvgB	AvgY
Center	48.1	48.1	48.1	48.1
L.T.	39.41	39.41	39.41	39.41
R.T.	40.14	40.14	40.14	40.14
L.B.	39.2	39.2	39.2	39.2
R.B.	40.06	40.06	40.06	40.06

- 1) Mouse left-click for horizontal line
- 2) Mouse right-click for vertical line
- 3) Picture left-top corner for LT-RB line
- 4) Picture right-top corner for RT-LB line

Shading calibration – Verify

➤ Shading verification

- Enable Shading in “CommonControlDialog”.
- Take picture with defined shading color temp.
- Click result picture for checking RGBY avg. curve smooth or not.

➤ Shading table import/export

- Import offline shading table (*.SDBLK)
- Export current shading table (*.SDBLK)

Parameter Control

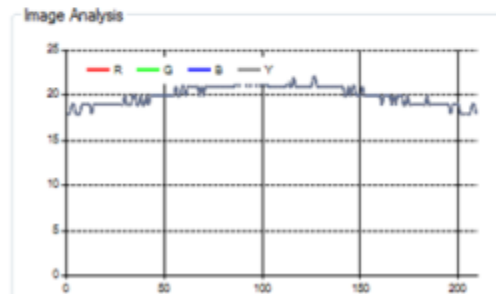
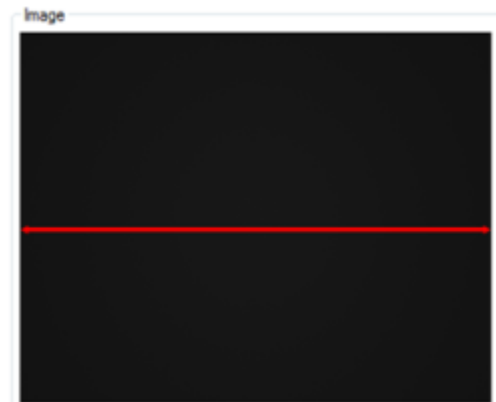
Coef Poly : 0.95 Ady. Para

Import SDBLK Export SDBLK Calculate

Color Temp

☐ Fixed ☐ Reserve

☒ High ☐ Middle ☐ Low



Shading calibration – Parameters

➤ camera_isp_lsc_\$sensor.h (Shading Table)

```
const NVRAM_CAMERA_SHADING_STRUCT CAMERA_SHADING_DEFAULT_VALUE = {
    Shading: {
        {
            Version:      5,
            SensorId:     664,
            GridXNum:     17,
            GridYNum:     17,
            Width:        5344,
            Height:       4016,
            CapTable: { // CapTable
                        { // Alight
0x80160014,0x0000001b,0x00080000,0x80240000,0x849b0000,0x4234823e,
0x00200011,0x00000017,0x80100000,0x802a0000,0x84730000,0x411f8259,
0x00180022,0x0000000c,0x001a0000,0x803b0000,0x844b0000,0x412d82e3,
0x00010020,0x0000002e,0x001f0000,0x80100000,0x86180000,0x52a88398,
0x002a801b,0x003d0011,0x800e0000,0x80270050,0x844c0000,0x3933824e,
0x8002801e,0x0032000e,0x00100000,0x002a0046,0x842e0000,0x38678272,
0x8019803b,0x00670029,0x00330000,0x005d0024,0x84270000,0x38b082fd,
0x800a803b,0x00618001,0x00200000,0x005c0089,0x858f0000,0x46d38388,
0x800d8001,0x80128015,0x001c0000,0x003b0084,0x83780000,0x315e8252,
0x000c000e,0x80280003,0x000e0000,0x0025006e,0x837a0000,0x30b18235,
0x80090014,0x804b8020,0x001a0000,0x006900a0,0x83630000,0x30fc8274,
0x8001001d,0x80508007,0x00170000,0x00640085,0x84810000,0x3cc48306,
0x000d001a,0x8015000a,0x000f0000,0x80070044,0x82b00000,0x2b4a822b,
0x8003000b,0x00028023,0x001b0000,0x000f0076,0x82960000,0x2a9e822a,
0x0015001e,0x800e8003,0x00100000,0x800f0040,0x82830000,0x2b368243,
0x80020003,0x00060001,0x00160000,0x001b0071,0x838b0000,0x34bf82d5,
0x80128020,0x00398016,0x001c0000,0x003c0064,0x82080000,0x2688822c,
0x800c801d,0x00240026,0x00180000,0x003e008d,0x82130000,0x2618820e,
0x801e8039,0x004a0016,0x00260000,0x005f0035,0x820e0000,0x26a88243,
0x800b8011,0x0010800b,0x00140000,0x00380074,0x82a50000,0x2e8e82b1,
0x8001000b,0x80280018,0x000a0000,0x003b0020,0x81840000,0x231281d9,
0x00000018,0x80328022,0x000b0000,0x00230080,0x81850000,0x225a81c9,
0x00040037,0x80628020,0x00080000,0x00260076,0x81630000,0x232181d2,
0x00050011,0x80240001,0x00090000,0x00170052,0x81df0000,0x2a158278,
0x80048007,0x80088011,0x00090000,0x000e0068,0x80fc0000,0x207b81bb,
0x80038013,0x00160017,0x000b0000,0x000a001b,0x80ea0000,0x200e81bf,
0x8010802f,0x00430015,0x000c0000,0x001a0016,0x80d70000,0x210781d8,
0x8002800b,0x000f8001,0x000e0000,0x00080054,0x81390000,0x26fc8274,
0x00120019,0x801c8005,0x00050000,0x802c0036,0x805d0000,0x1f3281bb,
0x00040019,0x80238019,0x00080000,0x80090060,0x806e0000,0x1e9f81b2,
0x00110029,0x804a800e,0x80040000,0x800e0055,0x806c0000,0x1fae81aa,
```

Shading Calibration Note for stereo

- Color Correction Setting : OFF
- Main2 TSF Setting
 - B+B : TSF Off
 - B+M : TSF On
- Shading Calibration Target
 - Main
 - Normal Light : No obvious Shading(Ratio over 85%)
 - Low Light : Lower down shading ratio depend on noise Level
 - Main2
 - Make sure Main2 shading compensation ratio is same as Main

TSF Web Training

Note

- Use Engineer Mode to capture PureRawData , not ProcessRawData ◦
- Capture PureRawData under uniform light source ◦
- Pure Raw Data & OTP Data have to follow naming policy(Please reference appendix A, B, C) ◦

Loggin MediaTek On-Line

- URL
 - <https://online.mediatek.com/>
 - Login with given MOL username / password
- Google Chrome are suggested.



Mediatek On-Line

MediaTek On-Line

Enter your username and password to login MediaTek On-Line!

SIGN

[Reset your password.](#)

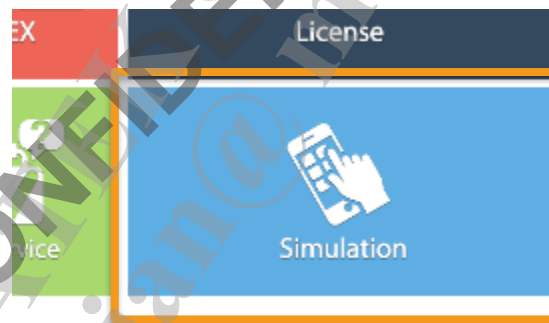
欢迎访问联发科技客户支持网 (MediaTek On-Line, MOL), 联发科技致力成为一家全球营运、技术领先的科技公司。

藉由不断提供最具创新性的产品和服务, 使客户获得成功。因此联发科技透过提供各种在线服务强化在线客服能力, 让联发科技的客户能在最快速的环境下自助式的取得开发联发科技产品所需要的相关技术支持, 以加速客户产品上市与提升客户产品质量, 进一步的在联发科技客户的成功之路上演更积极的角色。

如果有任何技术问题, 请联系相关联发科技代表; 如果是IT相关问题, 请与

MediaTek On-Line Front Page

- Click Simulation Icon



New TSF Tuning Request



Click “New”



















Request Type

Status

Duration

Keywords

FIND

Actions	Request ID	Status	Type	Project	File	Platform	Date	Requestor
  	sde201510000152	Completed	TSF					
  	sde201510000151	Completed	TSF					
  	sde201510000150	Completed	TSF					
  	sde201510000149	Completed	TSF					
  	sde201510000148	Completed	TSF					
  	sde201510000147	Completed	TSF					

Step 1: Select Service

选择服务 基本资讯 进阶资讯 確認提交

Choose Service

HOME

SW

• **TSF Tuning**  [User Manual - TSF.pdf](#)

Click “TSF Tuning” to write request form

Step 2: Write Basic Info

MTK CONFIDENTIAL
moremedian@

Select Service Basic Info. Advanced Info. Confirm

New TSF

HOME PREVIOUS NEXT

Basic Request Information

Project Name *

Platform MT6732

OTP * ☒ Yes ☐ No

Rotation *

Remaining Count 10 (One day only can submit 10 completed requests.)

Sensor Information

Sensor *

OB Value (0-6400) *

7. Click Next

1. Select Project Name

2. Select OTP (some platform not support)

3. Choose if Sensor Rotation (fill in only when OTP is yes. if not confirm, please select uncertain or ask FAE)

4. Only support 10 time calibration a day

5. Write Sensor Name

6. Write OB Value

IF SELECT OTP “NO”

Prepare Raw

- Amount restriction of Training data
 - training raw data at least 30 .

```
----- Total image loaded: 24 -----  
  
----- It is suggested to have at least 30 images for this module.  
----- Do you still want to continue (Y/N)? -----  
----- If press 'y' or 'Y', tuning results will be generated but  
----- may not be robust. So please check the quality carefully.  
----- If press 'n' or 'N', please add more images (from different units)  
----- to the tuning folder and re-run the tuning tool.  
  
Warning: do you still want to continue with the tuning anyway? (Y/N):
```

- Golden x 1 + corner x 3
 - A, CWF, D65, DNP, HOR, SKY, SUN, TL84 total 8 light source+ diffuser

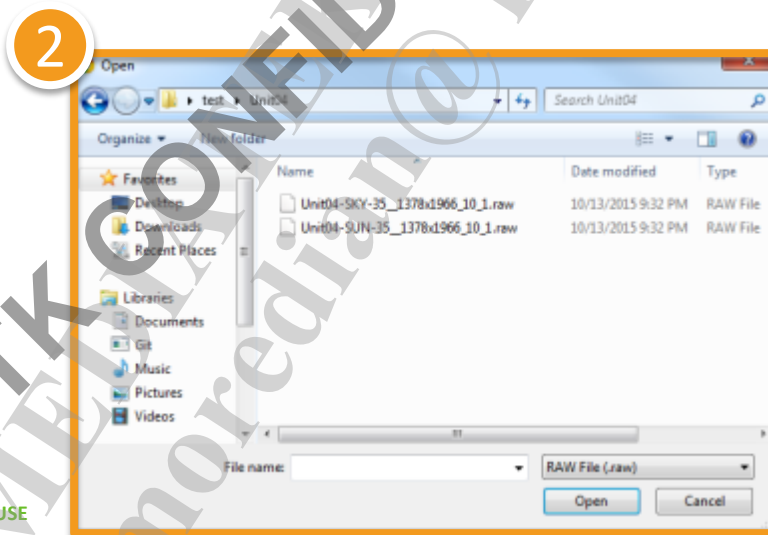
Step 3 - 1: Upload File (When OTP No , Only upload Pure Raw Data)

1. Click “Add File”



The screenshot shows a web interface for uploading data. At the top, there are four tabs: '选择服务' (Select Service), '基本资讯' (Basic Information), '进阶资讯' (Advanced Information), and '確認提交' (Confirm Submit). The '进阶资讯' tab is selected. Below the tabs, the title 'New TSF - Upload Data' is displayed. There are three buttons: 'HOME', 'PREVIOUS', and 'NEXT'. Under the heading 'Upload Pure Raw Data', there is a table with columns for 'File Name', 'Size', 'Progress', and 'Remove'. An 'Add Files' button is located to the right of the table, highlighted with a red box and a red circle containing the number 1. Below the table, there is an 'UPLOAD' button.

2. Select File
(Multi Select File)



Step 3 - 1: Upload File (When OTP No , Only upload Pure Raw Data)

选择服务 > 基本资讯 > 进阶资讯 > 確認提交

New TSF - Upload Data

HOME PREVIOUS NEXT

Upload Pure Raw Data

1 Upload Files + Add Files

[Unit01-TL84-A__1378x1966_10_1.raw] is not valid format (Append).
[Unit-TL84 -1 1378x1966 10 3.Raw] is not valid format (Append).

2

File Name	Size	Progress	Remove
Unit02-DNP__4208x3120_10_1.raw	25 MB	0%	X
Unit02-HOR__4208x3120_10_1.raw	25 MB	0%	X
Unit02-SKY__4208x3120_10_1.raw	25 MB	0%	X
Unit02-SUN__4208x3120_10_1.raw	25 MB	0%	X
Unit02-TL84__4208x3120_10_1.raw	25 MB	0%	X
Unit02-TL84-1__4208x3120_10_1.raw	25 MB	0%	X

Files: 6 Size: 150.2 MB

UPLOAD

1. System will show error message if file didn't follow naming rule . **(Naming Rule please folllow Appendix A)**

2. File which naming following rule will showed on upload list .

Step 3 - 1: Upload File (When OTP No , Only upload Pure Raw Data)

选择服务 > 基本资讯 > 进阶资讯 > 確認提交

New TSF - Upload Data

HOME PREVIOUS **3** NEXT

Upload Pure Raw Data

File Name	Size	Progress	Remove
Unit03-A_4208x3120_10_1.raw	25 MB	100%	X
Unit03-CWF_4208x3120_10_1.raw	25 MB	100%	X
Unit03-D55_4208x3120_10_1.raw	25 MB	34%	X
Unit03-D65_4208x3120_10_1.raw	25 MB	0%	X
Unit03-DNP_4208x3120_10_1.raw	25 MB	0%	X
Unit03-HOR_4208x3120_10_1.raw	25 MB	0%	X
Unit03-SKY_4208x3120_10_1.raw	25 MB	0%	X
Unit03-SUN_4208x3120_10_1.raw	25 MB	0%	X
Unit03-TL84_4208x3120_10_1.raw	25 MB	0%	X
Unit03-TL84-1_4208x3120_10_1.raw	25 MB	0%	X

Files: 10 Size: 250.4 MB

1 UPLOAD

1.After all file are in the list , Click Upload , to start process .

2.Check upload percentage from Progress .

3.After all file are uploaded done , Click Next .

Step 3 - 2 :Confirm File Info (When OTP No , Only confirm Pure Raw Data)

选择服务

基本资讯

进阶资讯

确认提交

Next TSF - Check Files

3

PREVIOUS

NEXT

Check Result Message

2

[Raw Data] Total file count should be above 22.
[Raw Data] Golden should have 1 set and Unit should have more than 3 sets.

Upload File Info. Pure Raw Data *

1

FileName	UnitID	IllumType	Append	Sensor Size	Bit	FirstPix
U10-A_3264x2448_10_3.raw	U10	A		3264x2448	10	3
U10-CWF_3264x2448_10_3.raw	U10	CWF		3264x2448	10	3
U10-D85_3264x2448_10_3.raw	U10	D85		3264x2448	10	3
U10-DNP_3264x2448_10_3.raw	U10	DNP		3264x2448	10	3
U10-HOR_3264x2448_10_3.raw	U10	HOR		3264x2448	10	3
U10-TL84_3264x2448_10_3.raw	U10	TL84		3264x2448	10	3
U1-A_3264x2448_10_3.raw	U1	A		3264x2448	10	3
U1-CWF_3264x2448_10_3.raw	U1	CWF		3264x2448	10	3
U1-D85_3264x2448_10_3.raw	U1	D85		3264x2448	10	3
U1-DNP_3264x2448_10_3.raw	U1	DNP		3264x2448	10	3
U1-HOR_3264x2448_10_3.raw	U1	HOR		3264x2448	10	3
U1-TL84_3264x2448_10_3.raw	U1	TL84		3264x2448	10	3

1. Confirm uploaded Pure Raw Data file info again .

2. Check System message (Please refer Appendix C) .

3. If there are file not upload, or system show message, click previous button to upload all data .

Step 3 - 2 :Confirm File Info (When OTP No , Only confirm Pure Raw Data)

选择服务 > 基本资讯 > 进阶资讯 > 確認提交

New TSF Check Files

HOME PREVIOUS **3** NEXT

Check Result Message **2** OK

Upload File Info Pure Raw Data * **1**

FileName	Unit	UnitType	Append	Sensor Size	Bit	FirstPics
Golden080-A_3264x2448_10_3.raw	Golden080	A		3264x2448	10	3
Golden080-CWF_3264x2448_10_3.raw	Golden080	CWF		3264x2448	10	3
Golden080-D65_3264x2448_10_3.raw	Golden080	D65		3264x2448	10	3
Golden080-DNP_3264x2448_10_3.raw	Golden080	DNP		3264x2448	10	3
Golden080-HOR_3264x2448_10_3.raw	Golden080	HOR		3264x2448	10	3
Golden080-TLS4_3264x2448_10_3.raw	Golden080	TLS4		3264x2448	10	3
U10-A_3264x2448_10_3.raw	U10	A		3264x2448	10	3
U10-CWF_3264x2448_10_3.raw	U10	CWF		3264x2448	10	3
U10-D65_3264x2448_10_3.raw	U10	D65		3264x2448	10	3
U10-DNP_3264x2448_10_3.raw	U10	DNP		3264x2448	10	3
U10-HOR_3264x2448_10_3.raw	U10	HOR		3264x2448	10	3

1. Confirm uploaded Pure Raw Data file info again .

2. Check System message (Please refer **Appendix C**) .

3. If system show OK , Click Next .

IF SECECT OTP “YES”

Step 3 – 1: Upload File (If OTP Yes , Upload Raw & OTP Data)

选择服务 > 基本资讯 > 进阶资讯 > 確認提交

New TSF - Upload Data

HOME PREVIOUS NEXT

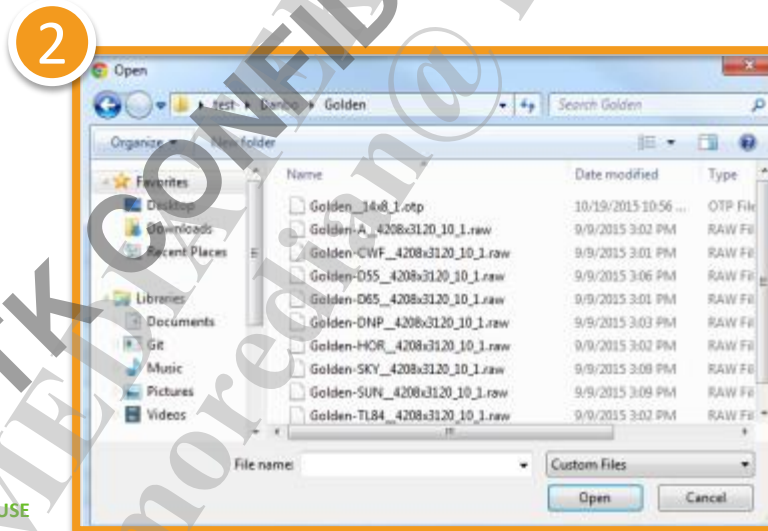
Upload Pure Raw Data & OTP Data

Upload Files

File Name	Size	Progress	Remove
Files: 0	Size: 0 B		

UPLOAD

1. Click "Add File"



2. Multi Select File

Step 3 – 1: Upload File (If OTP Yes , Upload Raw & OTP Data)

选择服务 > 基本资讯 > 进阶资讯 > 確認提交

New TSF - Upload Data

HOME PREVIOUS NEXT

Upload Pure Raw Data & OTP Data

1. Add Files

Unit07__17x18_2.otp] is not valid format (GridNumber).

File Name	Size	Progress	Remove
Unit02__14x8_1.otp	3 KB	0%	X
Unit03__14x8_1.otp	3 KB	0%	X

Files: 2 Size: 6 KB

UPLOAD

1. System will show error message if file didn't follow naming rule .

(Naming Rule please follow Appendix A, Appendix B)

2. File which naming following rule will showed on upload list .

Step 3 – 1: Upload File (If OTP Yes , Upload Raw & OTP Data)

New TSF - Upload Data

HOME PREVIOUS **3** NEXT

Upload Pure Raw Data & OTP Data

Upload Files				
File Name	Size	Progres	Remove	
Golden-A_4208x3120_10_1.raw	25 MB	100%	X	
Golden-CWF_4208x3120_10_1.raw	25 MB	100%	X	
Golden-D55_4208x3120_10_1.raw	25 MB	23%	X	
Golden-D65_4208x3120_10_1.raw	25 MB	0%	X	
Golden-DNP_4208x3120_10_1.raw	25 MB	0%	X	
Golden-HOR_4208x3120_10_1.raw	25 MB	0%	X	
Golden-SKY_4208x3120_10_1.raw	25 MB	0%	X	
Golden-SUN_4208x3120_10_1.raw	25 MB	0%	X	
Golden-TL84_4208x3120_10_1.raw	25 MB	0%	X	
Golden-TL84-1_4208x3120_10_1.raw	25 MB	0%	X	
Golden_14x8_1.otp	3 KB	0%	X	
Unit01_14x8_1.otp	3 KB	0%	X	
Unit02_14x8_1.otp	3 KB	0%	X	
Unit03_14x8_1.otp	3 KB	0%	X	

Files: 14 Size: 250.4 MB

1 UPLOAD

1. After all files are in the list, Click Upload, to start process.

2. Check upload percentage from Progress.

3. After all files are uploaded done, Click Next.

Step 3 - 2 :Confirm File Info (If OTP Yes , upload Raw & OTP Data)

选择服务 > 基本资讯 > 进阶资讯 > 确认提交

№ TSF - Check Files

3 PREVIOUS NEXT

Check Result Message

2 [Raw Data] Total file count should be above 22.
[Raw Data] Golden should have 1 set and Unit should have more than 3 sets

1 Upload File Info Pure Raw Data *

FileName	UnitID	FileType	AppVer	Sensor Size	Bit	FirstPlex
U10-A_3264x2448_10_3.raw	U10	A		3264x2448	10	3
U10-CWF_3264x2448_10_3.raw	U10	CWF		3264x2448	10	3
U10-D85_3264x2448_10_3.raw	U10	D85		3264x2448	10	3
U10-DNP_3264x2448_10_3.raw	U10	DNP		3264x2448	10	3
U10-HOR_3264x2448_10_3.raw	U10	HOR		3264x2448	10	3
U10-TL84_3264x2448_10_3.raw	U10	TL84		3264x2448	10	3

OTP Data *

FileName	UnitID	GridNumber	BayesOrder
Golden_14x8_1 otp	Golden	14x8	1
Unit01_14x8_1 otp	Unit01	14x8	1
Unit02_14x8_1 otp	Unit02	14x8	1
Unit03_14x8_1 otp	Unit03	14x8	1

1. Confirm uploaded Pure Raw Data file info again .

2. Check System message (**Please refer Appendix C**) .

3. If there are file not upload, or system show message, click previous button to upload all data .

Step 3 - 2 :Confirm File Info (If OTP Yes , upload Raw & OTP Data)

选择服务 > 基本资讯 > 进阶资讯 > 確認提交

New TSF Check Files

HOME PREVIOUS NEXT

3

2

1

Check Result Message

OK

Upload File Info. Pure Raw Data *

FileName	UnitID	UnitType	Append	Sensor Size	Bit	FirstPix
Golden060-A_3264x2448_10_3.raw	Golden060	A		3264x2448	10	3
Golden060-CWF_3264x2448_10_3.raw	Golden060	CWF		3264x2448	10	3
Golden060-D65_3264x2448_10_3.raw	Golden060	D65		3264x2448	10	3
Golden060-DNP_3264x2448_10_3.raw	Golden060	DNP		3264x2448	10	3
Golden060-HOR_3264x2448_10_3.raw	Golden060	HOR		3264x2448	10	3

OTP Data *

FileName	UnitID	GridNumber	BayerOrder
Golden060-14x8_1 otp	Golden	14x8	1
Unit01_14x8_1 otp	Unit01	14x8	1
Unit02_14x8_1 otp	Unit02	14x8	1
Unit03_14x8_1 otp	Unit03	14x8	1

1. Confirm uploaded Pure Raw Data file info again .

2. Check System message (Please refer **Appendix C**) .

3. If system show OK , Click Next .

Step 4: Confirm TSF Tuning Request Form

选择服务

基本资讯

进阶资讯

確認提交

Confirm TSF Setting

HOME

2

CONFIRM

Basic Request Information

Request ID	sde201510000146
Request Type	TSF
Project Name	
Platform	MT6732
OTP	No
Status	Authoring
Requestor	
Request Date	2015/10/28 16:51
Finish Date	2015/10/28 16:53
Additional mail to (Please input email split by ;)	

1

UPDATE

Simulation Parameters

Sensor	OV8808
OB Value	64
Pure Raw Data	

FileName	UnitID	IllumType	Append	Sensor Size	Bit	FirstPix
Golden060-A_3264x2448_10_3.raw	Golden060	A		3264x2448	10	3
Golden060-SWF_3264x2448_10_3.raw	Golden060	CWF		3264x2448	10	3
Golden060-D65_3264x2448_10_3.raw	Golden060	D65		3264x2448	10	3
Golden060-DNP_3264x2448_10_3.raw	Golden060	DNP		3264x2448	10	3
Golden060-HOR_3264x2448_10_3.raw	Golden060	HOR		3264x2448	10	3
Golden060-TL84_3264x2448_10_3.raw	Golden060	TL84		3264x2448	10	3

1. Set E-mail Address ◦

2. Click Confirm ◦

Inform Letter

- Once TSF Tuning done ,you will receive inform letter from system

亲爱的客户，

您的单号已被更新，请至[MES系统](#)查看：

单号: [sde201510000146](#)

类别: TSF

状态: Completed

Dear Esteemed Customer,

Your request has been updated. Please refer to [MES Home](#).

Request ID: [sde201510000146](#)

Request Type: TSF

Request Status: Completed

Check result of TSF Tuning

TSF Tuning Process status




















NEW

Request Type: All

Status: All

Duration: Last 3 Days

Keywords: **FIND**

Actions	Request ID	Status	Type	Project	File	Platform	Date	Requestor
  	sde20151000015	Completed	TSF					
  	sde201510000151	Completed	TSF					
  	sde201510000150	Completed	TSF					
  	sde201510000149	Completed	TSF					
  	sde201510000148	Completed	TSF					
  	sde201510000147	Completed	TSF					

a. If status is "Completed", click to link to result page
(system used 10-20 minutes) ◦

b. If "Error" or "Rejected", please check reason ◦

TSF Tuning result

- Click link to get result file ◦

Result
Message
Result

Exit Normally.

Type	Files
Data File	camera_tsf_data.h
Parameter File	camera_tsf_para.h

eService
eService

If you have any question for simulation result, please use eService to contact us.

TSF Offline Training Warning Message

- More info about Module Quality
 - Color uniformity of Unit Module
 - Normal Case > 85%
 - Color uniformity Consistence of difference module (under same light source)
 - Normal Case < 4%
- If value over spec, module or light source name will showed in error message

NOTE

Pure Raw Data Naming Rule(1/2)

unitID-IllumType-append__SensorSize_Bit_FirstPiex.raw
[Name] [Format]

1. Separate Name & Format by"__"
2. Name: (Separate by "-")
 - UnitID: Golden / G / Unit / U + number
 - IllumType: HOR / A / TL84 / CWF / D65 / DNP / DF / SUN / SKY
 - Append: INT(optional)
3. Format: (use"__") **(Note: Auto naming under EM。 Follow naming rule when Capture PureRawData under Normal mode)**
 - Sensor Size: INTxINT (Sensor Size, please refer Sensor Driver)
 - Bit: 8 / 10 / 12 / 14 / 16
 - FirstPiex: 0 / 1 / 2 / 3 (means StartPiex is B/Gb/Gr/R)

Pure Raw Data naming rule(2/2)

- If there are both Golden & Unit module, please follow naming rule
 - Ex. **Golden01-TL84**__2532x1902_10_2.raw
 - unitID : **Golden01**
 - illumType : **TL84**
 - Append : Null
 - Format : 2532x1902_10_2
 - Ex. **Unit01-TL84**__2532x1902_10_2.raw
 - unitID : **Unit01**
 - illumType : **CWF**
 - Append : Null
 - Format : 2532x1902_10_2
- If there are Golden & Unit, Limit Sample, please follow naming rule (Note: if there are multi Golden module ,only naming one module as Golden, other Golden module named as unit)
 - **Golden01-TL84**__2532x1902_10_2.raw (Means Golden module TL84 RawData)
 - **Unit01-TL84-1**__2532x1902_10_2.raw (Means Unit01 Module TL84 first RawData)
 - **Unit01-TL84-2**__2532x1902_10_2.raw (Means Unit01 Module TL84 second RawData)
 - **Unit01-TL84-3**__2532x1902_10_2.raw (Means Unit01 Module TL84 third RawData)
 - **Unit02-TL84**__2532x1902_10_2.raw (Means Unit02 Module TL84 RawData。 Multi module TL84 RawData naming as **Unit01/Unit02/Unit03/Unit04-TL84**__2532x1902_10_2.raw)

OTP Data naming rule(1/2)

unitID __ **GridNumber_BayerOrder**.otp
[Name] [Format]

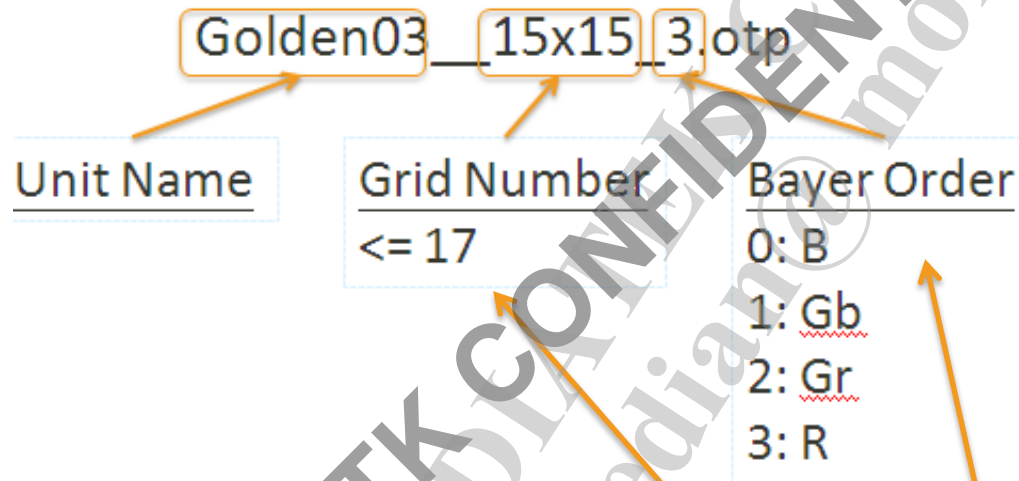
1. Separate Name & Format by " __ " .
2. Name:
 - UnitID: Golden / G / Unit / U + Number
3. Format: **(GridNumber & BayerOrder could get from Main Log)**
 - GridNumber: INT x INT (must <= 17)
 - BayerOrder: 0 / 1 / 2 / 3

Main Log .

[doShadingAlign] Start Align, IMG(1334 x 750), **Grid(14 x 8)**, **Bayer(1)**, GoldenGain(0xb7ae2110), UnitGain(0xb7aea1f0)

OTP Data naming rule(2/2)

- OTP Data
 - Both Golden & Unit module are needed
 - Get from main log



[LogGainTbl] Unit Gain Table			
0x36893d3e	0x3cce49d8	0x47024f3b	0x4ee26120
0x455d4c2b	0x4c905cc2	0x4017463a	0x463f52b9
0x3a293e72	0x3e944613	0x3464386c	0x38813dc4
0x30a6342d	0x347e380c	0x2f653274	0x320b35f3
.			
.			
.			
0x39643df4	0x3dda477c	0x3d7d4288	0x41f24e93
0x4248473d	0x47aa558b	0x44e14af8	0x4a715a2e
0x35533aee	0x3a7d470f	0x6e452029	0x0a726574

Main Log 中。

[doShadingAlign] Start Align, IMG(1334 x 750), **Grid(15 x 15)**, **Bayer(3)**, GoldenGain(0xb7ae2110), UnitGain(0xb7aea1f0)

TSF Tuning File Rule

Check Item	Without OTP	With OTP
Raw at least 30 pics	V	V
Module amount : Golden *1, Unit: at least *3	V	V
Every Module must have D65 , DNP , CWF , TL84 , A (Alight) , H	V	V
Every Format string of Raw File should same (SensorSize, Bit, FirstPiex)	V	V
Every module should have 1 OTP file, and the unit ID of OTP & Raw file should same (case-sensitive)		V
The Format String value of each OTP file should same(GridNumber, BayerOrder)		V

TSF Tuning FAQ

- **FAQ09396**

[camera Tuning]How to enable & tuning TSF (improve Color Shading)

- **FAQ11138**

[Camera Tuning] provide TSF PureRawData notice item

- **FAQ11142**

[Camera Tuning] How to confirm TSF Function work or not

Test TSF Result-Enable TSF

1. Modify tsf_tuning_custom.cpp

- vendor\mediatek\proprietary\custom\[platform,project]\hal\camera3a\tsf_tuning_custom.cpp

```
MBOOL isEnableTSF(void)
{
    return MTRUE;
}
```

2. Add Sensor-dependent TSF Parameter to customer folder

vendor\mediatek\proprietary\custom\[platform,project]\hal\imgsensor\ver2\sensor\camera_tsf_data_sensor.h

vendor\mediatek\proprietary\custom\[platform,project]\hal\imgsensor\ver2\sensor\camera_tsf_para_sensor.h

- Get these two files from TSF Tuning Output Folder
- Rename

Test TSF result-Enable TSF

3. Confirm there are such Code in Camera_info_\$\$sensor.h

```
#define INCLUDE_FILENAME_TSF_PARA      "camera_tsf_para_$$sensor.h"  
#define INCLUDE_FILENAME_TSF_DATA     "camera_tsf_data_$$sensor.h"
```

4. Do LSC Shading Tuning

- The High/Mid/Low Color Temperature Shading Table(Index 0~Index 2) of LSC are needed
- ~~Preview & Video LSC Shading Table is needed~~ => Only Capture LSC is needed
- The Shading Compensate Ratio is depended on LSC Shading Table

Test TSF Result-Enable TSF

- 5. Camera Tuning Flow

- TSF

OB -> LSC -> TSF -> AWB -> AF / AE -> Color -> ISP

LSC : Only Tuning **High/Mid/Low Color Temperature Shading**

TSF : MTK Server tuning

AWB: Enable TSF. FW will use default AWB setting for TSF when
AWB Tuning

Test TSF Result-Issue Check

6.1.If TSF Quality is not good enough

- Please confirm TSF is successfully Enabled
- Check TSF is enable or not
 - SHAD_TAG_TSF_EN = 0/1
- Check tuning data [\[Link\]](#)
 - Some of exif info should be equivalent to tuning parameters in “camera_tsf_para_xxxx.h” (xxx means project name)

DebugParser Version : [20130807], TSF Version : V1.1

EXIF TAG	EXIF value	Tuning value
SHAD_TAG_ENABLE_UNIT	0	0
SHAD_TAG_OVERWRITE_D	0	0
SHAD_TAG_TSF_DL_CT_ST	4300	4300,
SHAD_TAG_TSF_DL_CT_UC	4800	4800,
SHAD_TAG_TSF_DL_L_ST	110	110,
SHAD_TAG_TSF_DL_L_UC	135	135,
SHAD_TAG_TSF_DL_FL_ST	-50	-50,
SHAD_TAG_TSF_DL_FL_UC	50	50,
SHAD_TAG_TSF_H1	256	256,

Exif value應該要與Tuning para.h內容的值相符

```
#ifndef __TSF_TUNING_D_H__
#define __TSF_TUNING_D_H__

{
    0,
    0,
    4300,
    4800,
    110,
    135,
```

Test TSF Result-Issue Check

■ 6.2 Check Exif Info

- If tuning data is not consistent with the header file
 - Rebuild libcamcustom.so
 - \vendor\mediatek\proprietary\custom
 - Make sure all the header file were placed in correct folder
 - \vendor\mediatek\proprietary\custom\project\hal\imgsensor\ver2\module\

TSF tuning fail

- If Tuning fail, please check

- 1. OB correct or not
- 2. If Raw file broken
- 3. If there is defect in Raw檔, ex. Flicker, dust, ghost pattern, flare... °
- 4. If Phone not put well when capture(cause unusually Shading)

- If problem not in above list , please provide file to MTK

- Please sync Raw & JPEG file name
- The Folder of Raw File, please naming as “Sensor_Customer_OB_Appendix”
- Ex : OV8825_Apple_OB17_1

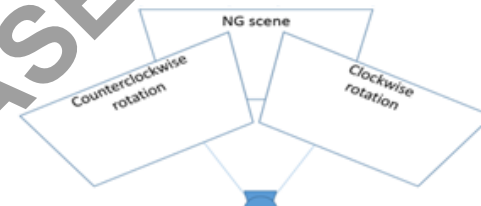
TSF Support Model

- If TSF quality is not good ,please check following item
 - 1. If TSF Enable
 - Please Enable according document
 - 2. Is EXIF TSF Parameter same as Tuning File
 - Please check Tuning File is correct or not
 - 3. Flash is trigger?(Flash Module which light is too concentrate, may cause light mix condition different between center and corner)
 - 4. Multi Light Source(TSF performs not good enough under mix light environment)
 - 5. The quality of use diffuser under this light source
 - 6. The quality under standard light source
 - 7. If Golden Module & Unit Module both perform bad
 - If Golden is good, but Unit is bad, please tuning golden and unit module at the same time when TSF tuning.(It could enhance module variation coverage)
 - If Golden also not good enough, please provide File to MTK

Prepare data for further analysis

[1] Trouble scene images

- provide Engineer mode Pure raw + jpeg + sdblk
- issue scene + counterclockwise rotate 45 degree issue scene
+ clockwise rotate 45 degree issue scene (refer to right image)
- capture + diffuser under issue scene (including above rotate case)
- use this module to capture under LSB (if quality not good , add this module into tuning)



[2] Custom tuning/calibration data

- camera_tsf_data_xxx.h
- camera_tsf_para_xxx.h
- camera_isp_lsc_xxx.h
- camera_tuning_para_.cpp

[3] Full tuning folders

Raw File Folder, naming as “Sensor_Customer_OB_Appendix”

Ex : OV8825_Apple_OB17_1

- Whole image when Tuning
- Tuning commend
- TSF_golden_config.txt (TSF 2.0 only)

[4] MTKLog

enable log by adb command, then record

- adb shell setprop debug.tsfc_core_exifdbg.enable 1
- adb shell setprop debug.tsfc_core.enable 1

[5] Dump AWB Stat

enable log by adb command, then capture

- adb shell setprop debug.lsc_mgr.log 255

file save at following path

- Sdblk => /sdcard/DCIM/CameraEM/*_tsfInput_cap.sdblk
- awb stat => /sdcard/DCIM/CameraEM/*_tsfInStat_cap.bin

Issue-TSF not Good

[Step1]Confirm Exif work or not

<1> Check Shading Enable Bit is enable or not

CAM_CTL_EN1[5] (sixth Bit) = 1/0

<2> Check TSF is enable or not

SHAD_TAG_TSF_EN = 1/0

<3> Check tuning data

camera_tsf_para_xxxx.h

[Step2]confirm if MTKLog input information is correct

lsc_mgr2_thread: SensorMode(0), full_0(3296,2480) crop1(12,12,3272,2456) resize(3264,2452) crop2(4,2,1632,1224) final size(1600,1200)

lsc_mgr2_thread: SensorMode(1), full_0(3296,2480) crop1(12,12,3272,2456) resize(3264,2452) crop2(4,2,3264,2448) final size(3264,2448)

lsc_mgr2_thread: SensorMode(2), full_0(3296,2480) crop1(12,12,3272,2456) resize(3264,2452) crop2(4,2,3264,2448) final size(1600,1200)

- confirm image resolution/offset reasonable or not.

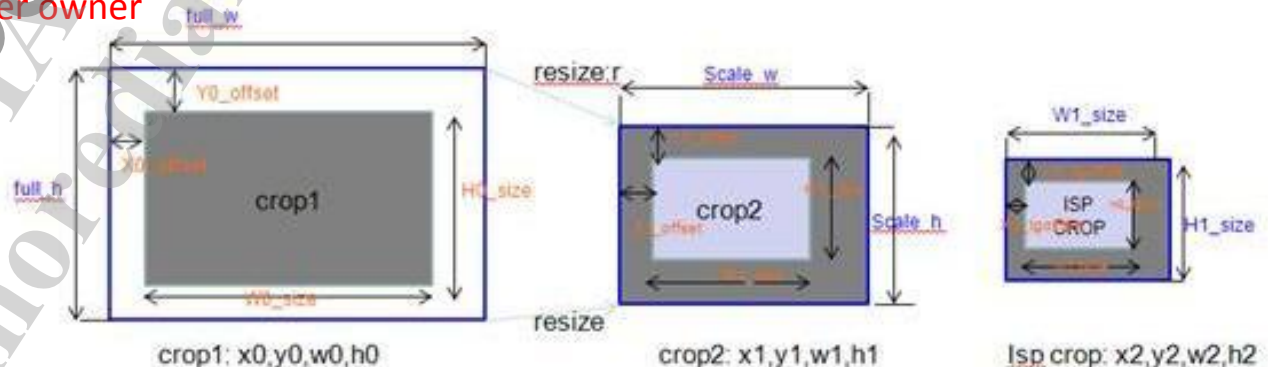
(If SensorMode(1), resize(3264,2452) crop2(4,2,3264,2448), crop from 4,2, after add 3264,2448 should over resize image total size, **not reasonable**)

- confirm if image crop size reasonable, crop region is the correct center region.

(If SensorMode(0), resize(3264,2452) crop2(4,2,1632,1224) means only crop left upper corner 1/4 region, **not reasonable**)

- If SensorMode(0/2), Final size != crop2 size, **not reasonable**

please check with sensor driver owner



Issue-TSF not Good-2

[Step3]

at least golden unit x 1 & corner unit x 2 to do manual training

[Step4]

If not help, please feedback to HQ