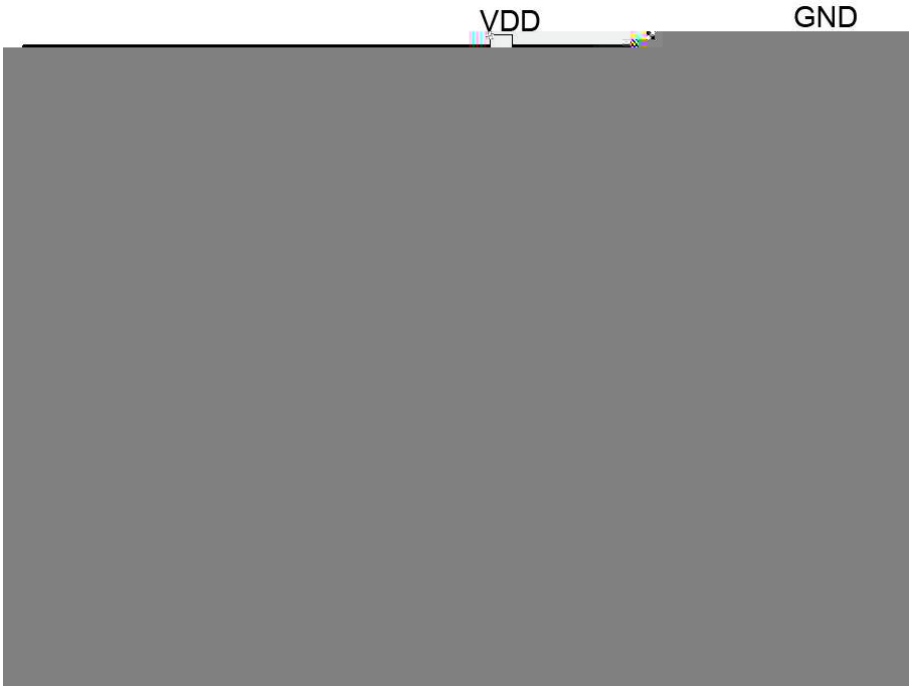
BRCL3160MF / BRCL3160MF
MOSFET
BRCL3160MF SOT23-6
BRCL3160MF

/Parameter	/Symbol	/Value	/Unit
V_{DD} input pin voltage	V_{IN}	-0.3 to +6.0	V
V_M input pin voltage	V_{VM}	-6.0	



BRCL3160MF

MOSFET

50mΩ

The BRCL3160MF monitors the voltage and current of a battery and protects it from being damaged due to overcharge voltage, overdischarge voltage, overdischarge current, and short circuit conditions by disconnecting the battery from the load or charger. The peripheral circuit is very simple. The MOSFET is integrated and its $R_{DS(ON)}$ is as low as 50mΩ typical.

If no exception condition is detected, charging and discharging can be carried out freely. This condition is called the normal operating mode.

VCU ,

TCU BRCL3160MF FET

1 VCL BRCL3160MF

2 BRCL3160MF

VM 0.7V

BRCL3160MF VCU

VCU BRCL3160MF VCU

VCU

VM 1

VCU VCU

1 2 VCU

1 2

When the battery voltage becomes higher than the overcharge detection voltage (VCU) during charging under normal condition and the state continues for the overcharge detection delay time (TCU) or longer, the BRCL3160MF turns the charging control FET off to stop charging. This condition is called the overcharge condition.

The overcharge condition is released in the following two cases:

1 When the battery voltage drops below the overcharge release voltage (VCL), the BRCL3160MF turns the charging control FET on and returns to the normal condition.

2 When a load is connected and discharging s fw Ł

VDL ,
TDL BRCL3160MF
FET VM VM VDD RVMD
IPDN VM VDD
RVMD VM VCHA ,
FET (VDL) BRCL3160MF
FET
VM VCHA ,
VDR

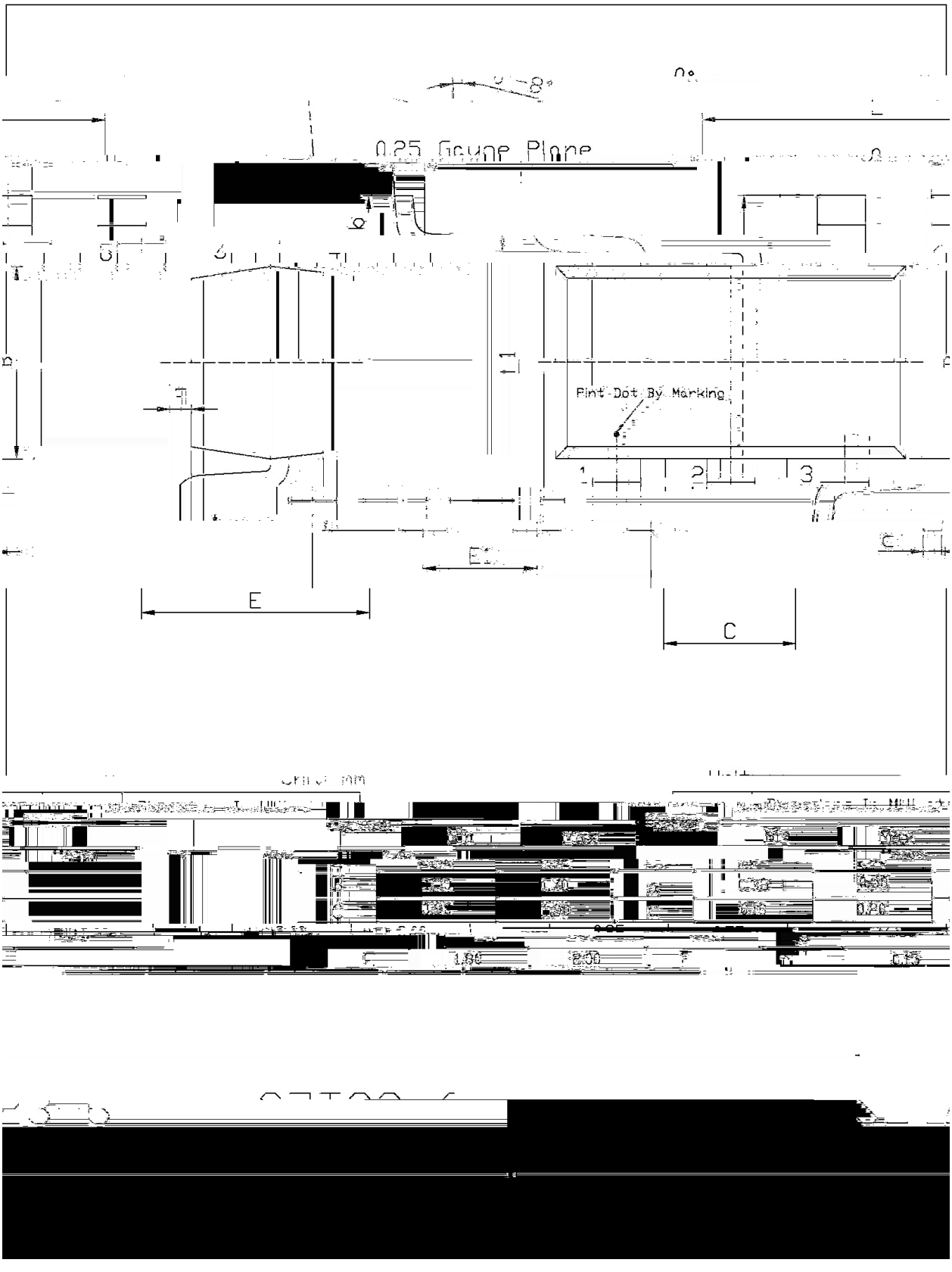
When the battery voltage drops below the overdischarge detection voltage (VDL) during discharging under normal condition and it continues for the overdischarge detection delay time (tDL) or longer, the BRCL3160MF turns the discharging control FET off and stops discharging. This condition is called overdischarge condition. After the discharging control FET is turned off, the VM pin is pulled up by the RVMD resistor between VM and VDD in BRCL3160MF the current of the chip is reduced to the power-down current (IPDN). This condition is called power-down condition. The VM and VDD pins are shorted by the RVMD resistor. The power-down condition is released when a charger is connected and the potential difference between VM and VDD becomes typical or higher,at this time, the FET is still off. When the battery voltage becomes the overdischarge detection voltage (VDL) or higher (see note), the BRCL3160MF turns the FET on and changes to the normal condition from the overdischarge condition.
Note: If the VM pin voltage is no less than the charger detection voltage (VCHA), when the battery under overdischarge condition is connected to a charger, the overdischarge condition is released (the discharging control FET is turned on) as usual, provided that the battery voltage reaches the overdischarge release voltage (VDR) or higher.

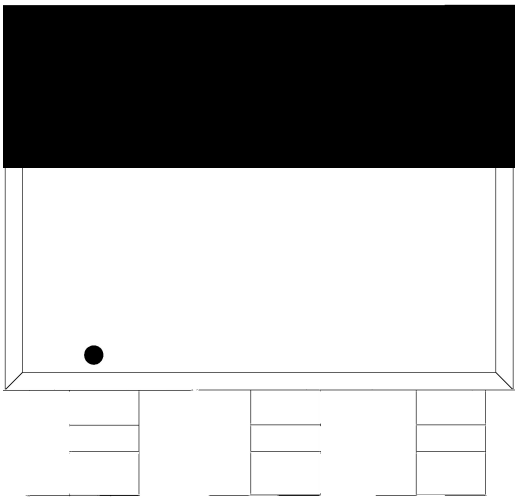
VM ,
,BRCL3160MF FET
1 2 ,VM GND RVMS
VM VDD
VM GND RVMS VM VM
1

VM (VCHA)
(TCU) BRCL3160MF FET
VM GND (VCHA) 0V
0V

If the VM pin voltage drops below the charger detection voltage (VCHA) during charging under the normal condition and it continues for the overcharge detection delay time (TCU) or longer, the BRCL3160MF turns the charging control FET off and stops charging. This action is called abnormal charge current detection.
Abnormal charge current detection is released when the voltage difference between VM pin and GND pin becomes higher than the charger detection voltage (VCHA) by separating the charger. Since the 0 V battery charging function has higher priority than the abnormal charge current detection function, abnormal charge current may not be detected by the product with the 0 V battery charging function while the battery voltage is low.

VM VSHORT tSHORT
BRCL3160MF VM VSHORT


0.25 Groove Plane
Pint Dot By Marking
E
C
1
2
3



5(



Note:

1 150 180 60 90see